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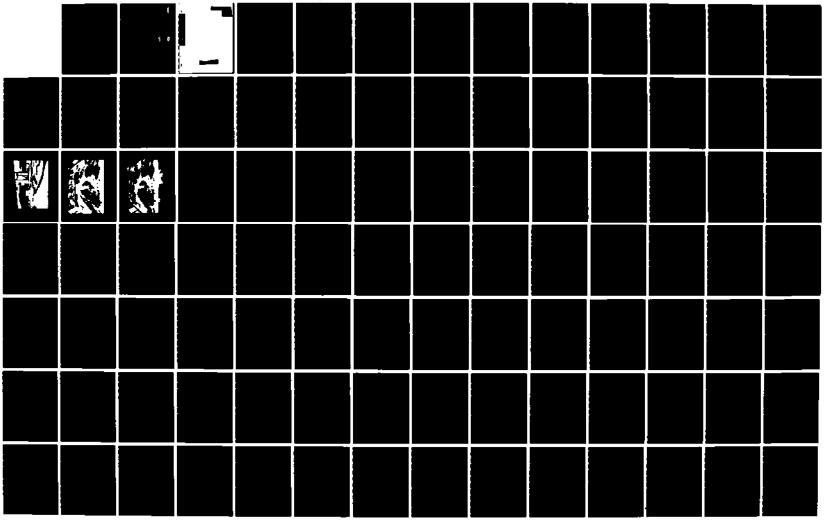

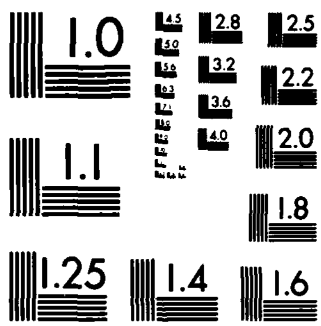
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SEEKVAL

Final Report

Volume II

AIDED VISUAL TERRAIN TABLE EXPERIMENTS (IB1)

September 1975

Contract No. F29601-74-C-0122
This Report is submitted in
fulfillment of Data Item
A002 of the contract
CDRL (DD 1473).

Approved:

Peter B. Brigham
Program Manager

Martin Marietta Corporation
Orlando Division
Post Office Box 5837
Orlando, Florida 32805

PREFACE

The SEEKVAL IB1 experiments documented in this report generated what is probably the largest body of target acquisition data ever accumulated in a single experimental series. These data, together with data generated in the other experiments conducted during Phase I, will provide a rich field for further exploration. The analyses presented in this document only scratch the surface, being addressed to the stated experimental objectives and a few additional findings, but time and funds simply did not permit the exhaustive treatment these data deserve.

Acknowledgement is gratefully given to all the dedicated individuals, both government and industry, who gave unstintingly of their time and talents in the design and conduct of the experiment and the preparation of this report. Particular thanks are due Col. J.R. Douglas, USAF, SEEKVAL Joint Test Director; Lt. Col. A.B. Loggins, USAF, SEEKVAL Programs Manager; LTC. D.C. Yopp, USA, SEEKVAL IB1 Project Manager; Mr. Dave Power, SEEKVAL Technical Advisor, Mr. Alan Blankfield, then of CALSPAN Corporation, SEEKVAL Consultant; and Mr. R.E.L. Johnson, Dr. Wayne Knight and Dr. Lane Schieber, of the Institute for Defense Analysis.

Special recognition should also go to the 584 Observers who participated in and lent support to this experiment.

On the Martin Marietta team, thanks are due to Dr. Daniel B. Jones, Principal Experimenter; Messrs. Theodore Romans, Julian A. Sears, and Nestor Moya, Experimenters; Messrs. John E. Lupo and Nathan Johnson, Statistical Analysis; and Messrs. Harry Roach, C.E. Jones, Harold Vance, Charles Kelley, George Marks, Wesley Carter, Richard Bond, George McClary, and Joel Johnson who collectively made the mass of hardware and software function day in and day out to meet a demanding schedule. The work of Mr. Robert Boemler, who coordinated the analytical sections of this report and developed the conclusions, is deeply appreciated.

Also to Mr. Ronald D. Monroe, Guidance Development Center Manager, and my immediate boss, my deep appreciation for his understanding and wise counsel.

Peter B. Brigham
SEEKVAL Program Manager
Martin Marietta Corporation
Orlando, Florida

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EXECUTIVE SUMMARY

Objectives

As an element of the SEEKVAL Program objectives prescribed in WSEG Report 196, the objectives of the IB1 Aided Terrain Table Experiments were defined as follows:

a) Determine the relative effectiveness of visual search aided by an acquisition sensor when compared with direct visual search alone, under several variations of illumination, table configurations, and target arrangements.

b) Demonstrate the degree of utility of terrain tables with physical models as tools for the evaluation of alternative target acquisition systems and techniques.

Experimental Factors

There were nine experimental factors established in the IB1 experiment: method of search, clutter, contrast, illumination angle, number of targets, pop-up range, pop-up altitude, coloration, and Observer training. The first eight of these were explicitly identified in the project plan and the Observer training was implied inasmuch as an equal number of trained and untrained Observers was used. Table I provides a description of the IB1 experiment design.

TABLE I. SUMMARY OF THE IB1 EXPERIMENT DESIGN

Sub-experiment Number	Number of Observers		Mode	Scale	Number of Terrain Table Configurations	Number Runs	Altitude (Feet)	Speed (Knots)	Measure of Acquisition Effectiveness	Variables
	Trained	Untrained								
1	96	96	Fixed wing	800:1	6	1151	3000	400	Range	Method of Search, Clutter, Contrast, Illumination Angle
2	16	16	Fixed wing	800:1	4	192	3000	400	Range	Method of Search, Clutter, Contrast, Illumination of Targets
3	24	24	Fixed wing	800:1	1	285	3000	400	Range	Method of Search, Clutter, Contrast, Illumination Angle
4	108	108	Rotary wing	200:1	4	864	Var	0	Time	Method of Search, Clutter, Contrast, Range, Altitude
5	48	48	Rotary wing	200:1	4	384	800	0	Time	Method of Search, Clutter, Range, Color of Targets and Background

A brief discussion of the nine factors considered in the experiment follows.

Method of Search

Fixed wing experiments:

1 Direct visual without any aid available

2 Direct visual with a wide field of view (WF) television sensor (8 degrees) to be used at the option of the Observer

3 Direct visual with a narrow field of view (NF) sensor (2 degrees), also optional

4 Direct visual with a variable field of view (VF) sensor (8 degrees to 2 degrees), also optional.

Rotary wing experiments:

1 Direct visual without any aid available

2 Direct visual with a stabilized optical (monocular) device to be used at the option of the Observer

3 Direct visual with an electro-optical *television sensor*, also optional.

Clutter

This was defined as target-like objects within a 200 meter radius of the target array. The levels of clutter were: low--no objects, medium--20 objects, and high--60 objects. The clutter objects were scaled the same as the targets and composed of deciduous trees, bushes, and conifers.

Contrast

Contrast was defined as the ratio of the target and background luminances in two different levels; low -- negative contrast of -0.20 to -0.50 and high -- negative contrast of -0.60 to -0.90 (negative contrast meaning that the target was darker than the background).

Illumination Angle

There were two types of illumination: overcast sky (no shadows) and direct sunlight. The direct sunlight was simulated at four different azimuths and two elevations:

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

Report of experimental series in which a number of trained and untrained subjects made multiple target acquisition attempts against a terrain model from both fixed wing and rotary wing flight profiles. Controlled variables included illumination angles, contrast, clutter, coloration, and search methods used.

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Elevation 40 degrees - Azimuths of 0, 45, 90 and 180 degrees from the point of view of the Observer.

Elevation 20 degrees - (the same four azimuths)

Number of Targets

The targets were three U.S. M-60 tanks, scaled 800:1 for the fixed wing experiments, and 200:1 for the rotary wing tests. In sub-experiment 2, where the number of targets was varied, the number used was none, one, three, and nine.

Pop-up Range

This was a factor in the rotary wing experiments only and the ranges assigned were 1500, 2850, and 4200 meters, measured horizontally from Observer to target.

Pop-up Altitude

This was a variable in sub-experiment 4 only and the altitudes assigned were 800, 1300 and 1800 feet.

Coloration

Target and background colorations were variables only in sub-experiment 5 with the tanks painted either olive drab or camouflaged (pattern painted) and set against either a brown or green background.

Observer Training

The Observers used were evenly divided between trained and untrained. The trained Observers were military aviators and the untrained were civilians with little or no flying experience.

Experimental Analysis

In the five sub-experiments, each observer received all levels of only two factors, usually clutter and contrast, and only one level of the remaining factors. This resulted in a design in which subjects were nested within some factors and crossed with others. Analysis of variance as well as certain non-parametric methods, i.e. χ^2, were used to analyze the data. However, in performing the sub-experiments there was a significant number of missing acquisitions (approximately 60 percent in experiments 1, 2, and 3 and 10 percent in experiments 4 and 5). This produced a truncated sample in which the sample means might not be representative of the population means. Because of the missing data, the sub-experiments were analyzed by the GLM as completely crossed designs, which meant that the inter-subject variability could not be estimated. Consequently, the conclusions reached from the analysis of variance must be viewed with caution. The results of the χ^2 analysis, however, are not subject to these limitations.

Experimental Results

The results of the experiments are discussed in detail in Sections 2.0 through 6.0. Each of these sections is devoted to a complete description and conclusions of each of the five sub-experiments. Section 7.0 discusses the effects of the several variables on target acquisition performance, as seen across the entire experiment. Section 8.0 presents conclusions and recommendations. The appendices contain details and descriptions of facilities, experimental procedures, analytical techniques, and conduct of the sub-experiments.

Table II shows the influence of the nine factors examined in the five sub-experiments.

TABLE II. RELATIVE INFLUENCE OF EXPERIMENTAL FACTORS

Factors	Sub-experiments				
	1	2	3	4	5
Method of Search	Significant	Minor	Significant	Major	Major
Clutter	Major	Significant	Significant	Major	Major
Contrast	Minor	Minor	Minor	Significant	No Factor
Illumination Angle	Minor	No Factor	Minor	No Factor	No Factor
Number of Targets	No Factor	Significant (Range only)	No Factor	No Factor	No Factor
Pop-up Range	No Factor	No Factor	No Factor	Major	Major
Pop-up Altitude	No Factor	No Factor	No Factor	Minor	No Factor
Coloration	No Factor	No Factor	No Factor	No Factor	Minor
Observer Training	Minor	Minor	Minor	Significant	Significant

Major - Statistically significant and exerted powerful influence on the results.

Significant - Statistically significant but not overpowering.

Minor - Not statistically significant, but showed a consistant trend.

No Factor - Not a factor in the experiment.

Brief discussions of the results presented in Table II follow:

Method of Search

For the three fixed wing sub-experiments, the direct visual was used more frequently by the Observers. However, the WF produced the longest mean range at acquisition and the highest probability of acquisition. For rotary wing, direct view was utilized almost to the exclusion of the aids at the short ranges, but not at the 4200 meters range.

Clutter

In all five sub-experiments, target acquisition tended to degrade progressively as the clutter density increased from medium to high.

Contrast

The contrast ratio of the target with respect to its background appeared to have little influence on target acquisition.

Illumination Angle

Sun angle appeared to have only minor influence, with 40 degrees elevation being slightly better than 20 degrees.

Number of Targets

Increasing the number of targets in the search area increased the probability and range of detection.

Pop-Up Range

In the rotary wing sub-experiments target acquisition decreased as range increased.

Pop-Up Altitude

In the rotary wing sub-experiments target acquisition performance did not vary with altitude.

Target and Background Coloration

Target acquisition performance was not influenced by target color and was only slightly influenced by background color.

Observer Training

Trained Observers performed slightly but consistently better than untrained Observers in the fixed wing sub-experiments. Rotary wing results showed trained Observers to be markedly better than untrained. Intersubject variability within each group is not known.

Conclusions

The overall objective of the SEEKVAL Program, as stated in WSEG Report 196 is to evaluate alternative systems and techniques for acquiring targets in combat air support. It is concluded that this objective was served in the IB1 Experiment in that four modes of target acquisition were evaluated in the fixed wing sub-experiments and three modes were evaluated in the rotary wing sub-experiments.

The specific objectives of experiment IB1 were:

1 Determination of Relative Effectiveness of Search Methods

This objective was accomplished. In general it was found that the visual aids were useful in some cases, particularly

at the longer ranges (more than 4500 meters). However, at the shorter ranges, the observer generally preferred to use direct, unaided vision. It appears obvious that the aids must be flexible enough so that direct vision can be readily substituted when appropriate. Above all, aids must not introduce a task complexity that negates operational effectiveness. The helmet sight controlled variable field of view sensor used in the fixed wing experiments appeared to meet these criteria.

2 Demonstration of Terrain Table Utility

Any final judgment as to the effectiveness of this experiment in meeting this objective must await the results of the SEEKVAL IE Experiment (flight tests at Fort Lewis, Washington) which is specifically designed to determine the validity of the IB1 and IB2 Experiments. It can be stated at this time however, that the IB1 results do correlate well with other terrain table experiments and flight tests.

1.0 INTRODUCTION

1.1 Background

In June 1972, the Director of Defense Research and Engineering (DDR&E), in a memorandum to the Director, Weapons System Evaluation Group (WSEG), pointed out the need for a coordinated interservice evaluation of the capabilities of acquiring targets during Combat Air Support missions.[1] In response, WSEG outlined a plan for determining the ability of observers to acquire ground targets from both fixed and rotary wing aircraft.[2]

The resulting program, called SEEKVAL, was divided into two phases. Phase I was limited to the study of target acquisition from fixed and rotary wing aircraft performing Combat Air Support missions in a representative Central European environment under daytime visual conditions. Phase II addressed target acquisition from the same types of aircraft performing the same missions in the same environment, but under night and adverse weather conditions.

The project plan for Phase I, published in WSEG report 196, outlined a series of experiments to evaluate target acquisition systems and techniques. One of these experiments was directed toward the comparative evaluation of visual and aided-visual acquisition of targets under laboratory conditions. This experiment, entitled Aided Visual Terrain Table Experiments (IB1), was further defined in WSEG report 230.[3] Basically it involved the evaluation of the ability of an Observer to detect and acquire selected target models arranged on a terrain table by: direct viewing and/or aided viewing.

In October 1974, the IB1 Project Plan[4] was published. This plan provided a detailed description of the five sub-experiments to be performed to satisfy the requirements of WSEG reports 196 and 230. As set forth in the IB1 Project Plan, the specific objective of the terrain table experiments were to:

---

[1] Combat Air Support encompasses Close Air Support as defined in a joint memorandum issued by the Secretaries of the Army and Air Force on 26 March 1970.

[2] WSEG 196, "Operational Test and Evaluation of the Capability to Acquire Targets in Combat Air Support: Description of Initial Test Program," (Comprising IDA Paper P-911), D.L. Randall, Insitute for Defense Analyses, Arlington, Va., February 1973.

[3] WSEG 230, "Design of Aided Visual Terrain Table Experiments for Project SEEKVAL" (Comprising IDA Paper P-1016) R.E.L. Johnson Jr., Institute for Defense Analysis, Arlington, Va., April 1974.

[4] "SEEKVAL Project Plan IB1, Aided Visual Terrain Table Experiment," LTC Dewey C. Yopp, U.S. Army, Orlando, Florida, October 1974.

1. Determine target acquisition performance for fixed wing profile, i.e., constant altitude and speed, for visual search aided by an acquisition sensor when compared with direct visual search. Controlled variables were clutter, target-to-background contrast, and illumination.

2. Determine the effects of different numbers of targets with variable clutter and contrast for the fixed wing aircraft profiles for aided and unaided search.

3. Determine effects of various sun angles with associated shadows on target acquisition performance for fixed wing aircraft for aided and unaided search.

4. Determine target acquisition performance for rotary wing aircraft using pop-up tactics for visual search aided by an acquisition sensor when compared with direct visual search. Controlled variables were clutter, contrast, range to target, and pop-up altitude.

5. Determine the effects of target and background coloration for the rotary wing profile for aided and unaided search.

6. Generate data that can be used in conjunction with field test data to provide an evaluation of the utility of the terrain table as a tool in the evaluation of alternative target acquisition systems and techniques.

The Orlando Division of the Martin Marietta Corporation was selected to conduct the IB1 portion of the SEEKVAL program. To ensure maximum benefit from the experiments, the devices tested, scenarios adopted, and procedures used at the Orlando Division were kept as close as possible to operational reality. Further, the conditions chosen and data recorded were carefully planned to provide a high degree of correlation with the flight test validation planned as a subsequent SEEKVAL experiment.

These five sub-experiments were designed to build on the results of the direct visual terrain table and target imagery experiments previously conducted as part of the SEEKVAL program.[1]

Generally, the objectives of the five individual sub-experiments were stated in terms of how primary and secondary factors influence target acquisition performance (range at - or time to - target acquisition,[2] percentage of correct targets, and number of incorrect targets). Specifically, the objective of sub-experiment 1 was to provide a definitive framework for the examination of clutter/contrast and method of search,[3] and for the determination of their effects on target acquisition performance. The objective of sub-experiment 2 was to examine the effects of number of targets per zone on target acquisition performance. The objective of sub-experiment 3 was to carry out an in-depth examination of angle of illumination, nominally considered in sub-experiment 1, and to determine its effect

on acquisition performance. Sub-experiments 1, 2, and 3 employed a fixed-wing profile.

The objective of sub-experiment 4 was to determine the effect of clutter/contrast on acquisition in the rotary wing flight profile. The object of sub-experiment 5 was to determine the relation of coloration of target and background to the acquisition task for a rotary wing profile.

As shown in Table 1-I, method of search was a prime consideration in all five sub-experiments. In contrast, while the effects of clutter/contrast were measured in all sub-experiments, they are dominant only in 1 and 4. Each of the other factors occurred as dominant in a specific sub-experiment designed to study that interaction.

---

[1] Experiment IA1, a terrain table experiment conducted by the Aerospace Medical Research Laboratory at Wright Patterson AFB, Ohio, was an earlier SEEKVAL experiment which explored the effects of sun angle on the target acquisition process. For a discussion of this and other related experiments, see Appendix C.

[2] Target acquisition, as used in Experiment IB1, combines several elements of the detection-recognition-identification process. The test Observers were briefed to indicate target acquisition when they were sufficiently sure of the target to be willing to commit ordnance in a "free fire" zone, i.e., only enemy formations are present.

[3] For purposes of interpretation of the method of search data presented in this report, it is necessary that the search method practices in these experiments be examined in the light of the first objective of the IB1 program as stated in WSEG Report 230 and the Project Plan. The first objective was ". . .to determine the relative effectiveness of visual search aided by an acquisition sensor as compared with direct visual search alone." When one of the aids was called for, the wording of the objective, "visual search aided by an acquisition sensor" necessitated leaving the Observer the option of using direct visual search or the aid at his discretion. The mechanization of the sensor system (as required by the statement of work) encouraged direct visual search followed by sensor examination of the area of interest and the briefings, in fact, recommended this procedure. However, the Observer could, if he wished, use visual search alone, sensor search alone, or the recommended combination of the two.

TABLE 1-I. OBJECTIVE RANKING BY SUB-EXPERIMENT

Factors	1	2	3	4	5
Method of search	Primary	Primary	Primary	Primary	Primary
Clutter	Primary	Secondary	Secondary	Primary	Secondary
Contrast	Primary	Secondary	Secondary	Primary	-
Illumination angle	Secondary	-	Primary	-	-
No. of Targets/zone	-	Primary	-	-	-
Pop-up range	-	-	-	Primary	Secondary
Pop-up altitude	-	-	-	Secondary	-
Target and background coloration	-	-	-	-	Primary

1.2 Laboratory Configuration

Experiment IB1 was conducted in the Optical Laboratory of the Guidance Development Center. The laboratory was configured as shown in Figure 1-1.

The Observer was located in the habitat suspended from the lateral carriage and horizontal transporter system beam which was used to statically position the habitat in latitude and altitude for each run. The construction of the habitat was simple and functional. The interior contained an aircraft seat, a control stick, a set of fixed rudder pedals as foot rests, and a TV monitor mounted in an instrumentation panel. Therefore, the habitat was a faithful representation of an aircraft cockpit only to the extent necessary to provide a convincing environment for the Observer and provide for his safety. No attempt was made to duplicate features which would task-load, distract, or subject the Observer to stresses beyond those imposed by the basic acquisition problem.

A tracker gimbal and TV camera with an auto-focusing lens and zoom was mounted above the Observer's head. The computation for the focus control for the lens system was done on one of the analog computers using the longitude, latitude and altitude positions of the transporter drives. The tracker gimbal was controlled by the subject wearing a helmet sight or by a control stick mounted in the habitat.

The longitudinal motion or range closure was accomplished by moving the 40 foot x 40 foot terrain model on its rails. The velocity of the three transporters was controlled through their drive systems by the analog computer.

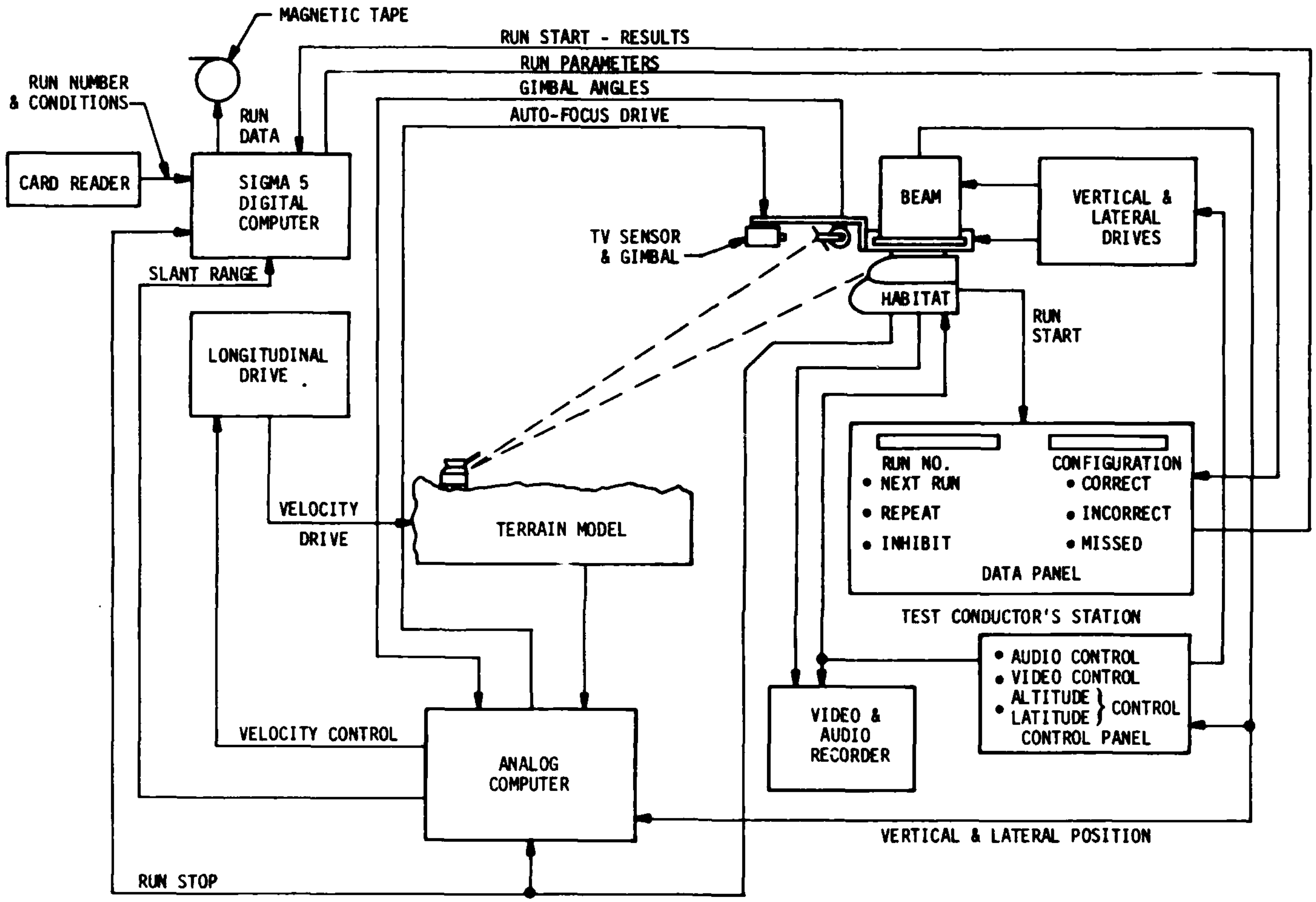


Figure 1-1. Laboratory Configuration

The basic terrain and vegetation was built to an 800:1 scale. Targets and clutter elements (trees, shrubs, etc.) in the target zones were scaled at 800:1 for the fixed wing experiments and 200:1 for the rotary wing experiments.

The area was similar to Fort Lewis, Washington, and was representative of the type of terrain that was chosen by the experiment. Foliage was thickest at the higher elevations where conifers prevail. At the lower elevations, deciduous trees and shrubs predominated, leaving large open areas. Target zones were evenly divided with three being at lower elevations in open areas and three at higher elevations with more surrounding trees. In all cases, the immediate target zone was cluttered in a controlled manner corresponding to the manipulation of this variable in the experiments.

The target tanks were scaled to 800:1 and 200:1 to provide a contrast and color set for each target location. Paints represented clean O.D., dusty O.D., and patterned camouflage.

Depending on their proximity to target zones, cultural details such as buildings and roads either remained at the basic 800:1 scale or changed to 200:1 as required.

In the course of the experiments it was necessary to vary target/background contrast, background coloration, clutter density, and number of targets. Target/background contrast was varied primarily by using clean O.D. tanks (high contrast) and dusty O.D. tanks (low contrast). Where photometric measurements indicate, the background or targets were painted to produce the correct contrast.

Background coloration was varied by painting. Clutter density was varied by placing additional conifer and deciduous vegetation in the clear target zones and removing it as required. Numbers of targets were varied by adding and removing tanks of the correct color for the specific target area, at the required contrast.

An Experimenter's station was located next to the habitat which allowed the Experimenter to control and observe the experiments. His equipment consisted of a duplicate TV monitor, program display and keyboard system, and laboratory control panel.

Terrain model lighting was provided by a solar simulator providing 500 foot-candles and supplemental overhead lighting providing up to 500 foot-candles depending on the experimental illumination conditions. Both systems provided a reasonable match to sunlight for color temperature.

A hybrid computer located in the Computer Room provided the computation. An analog computer provided laboratory computation and control while the digital computer provided data acquisition and reduction.

Each day, prior to the first Observer's arrival, the laboratory setup was validated by making standardization runs to check the drives, data entry and recording, habitat system, and lighting.

During a run, the run number and the run test conditions were displayed to the Experimenter and test conductor. This insured that the data stored on digital tape by the computer correctly corresponded to the run being made. The data from each run was then sent to the computer for processing and print out.

Figure 1-2 shows the Optical Laboratory configured for SEEKVAL experiments. Figure 1-3 shows the six zones used on the terrain table for fixed wing experiments. Figure 1-4 shows the four zones used on the terrain table for rotary wing experiments. A detailed description of the Optical Laboratory and specialized SEEKVAL equipment is described in Appendix B.

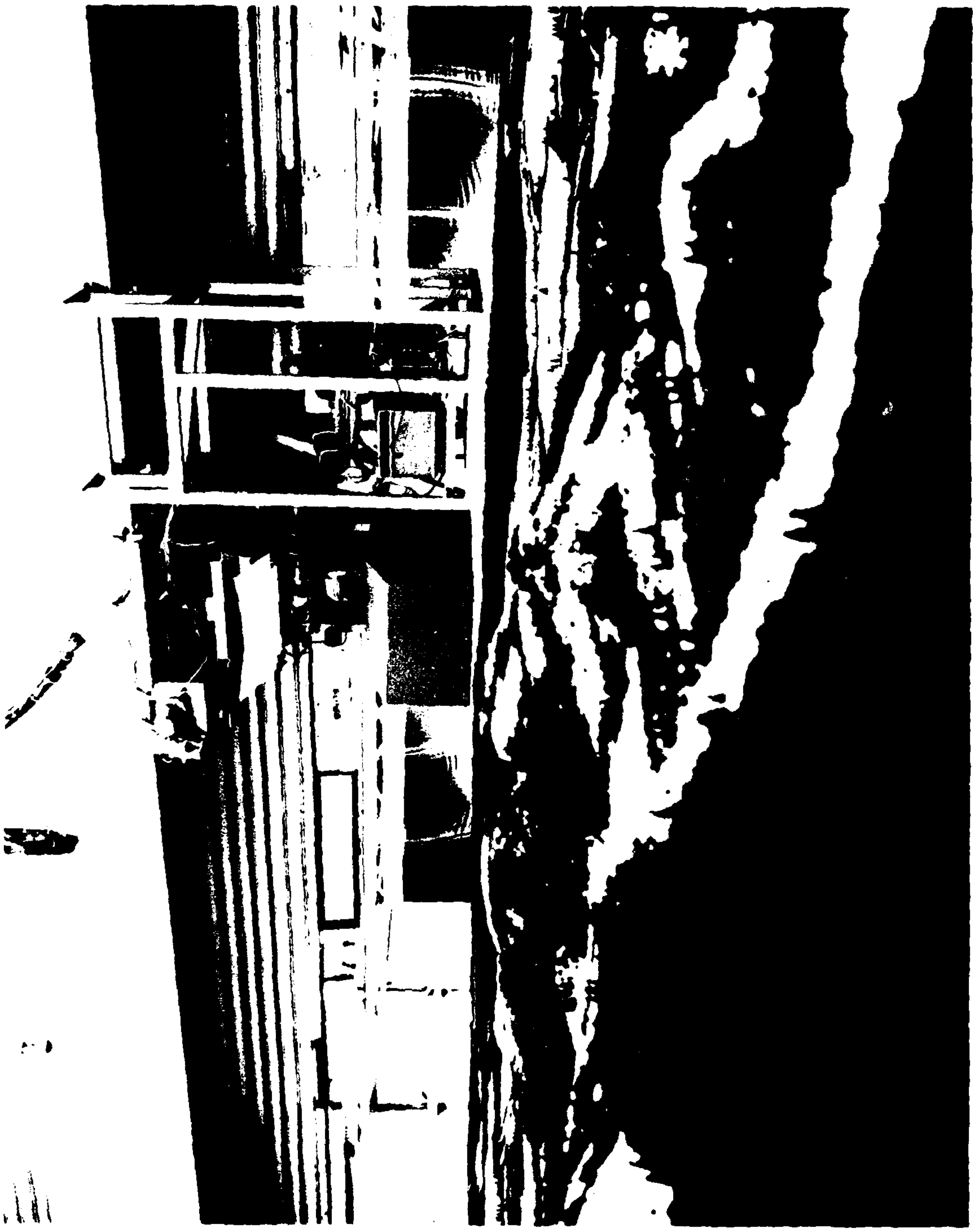


Figure 1-2. Optical Laboratory Set-up

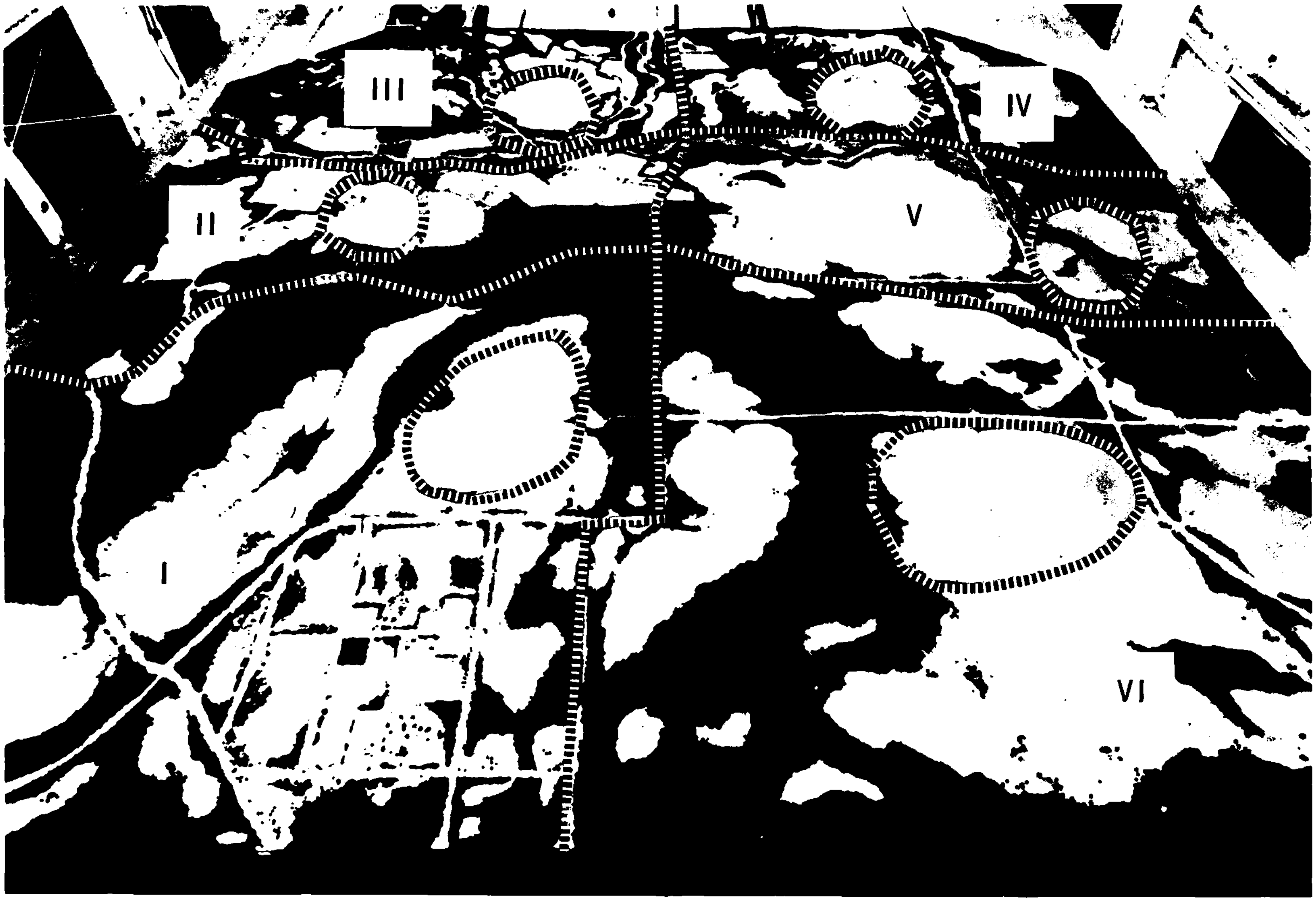


Figure 1-3. Six Target Zones for Fixed Wing Targets

Figure 1-4. Four Target Zones for Rotary Wing Tests

2.0 SUB-EXPERIMENT 1

2.1 Objectives

As stated in the IB1 Project Plan the primary objectives of sub-experiment 1 were to determine target acquisition performance as a function of:

1. Search method
2. Clutter in the target area
3. Target-to-background contrast.

The secondary objective was to determine target acquisition performance as a function of illumination angle.

2.2 Experimental Design

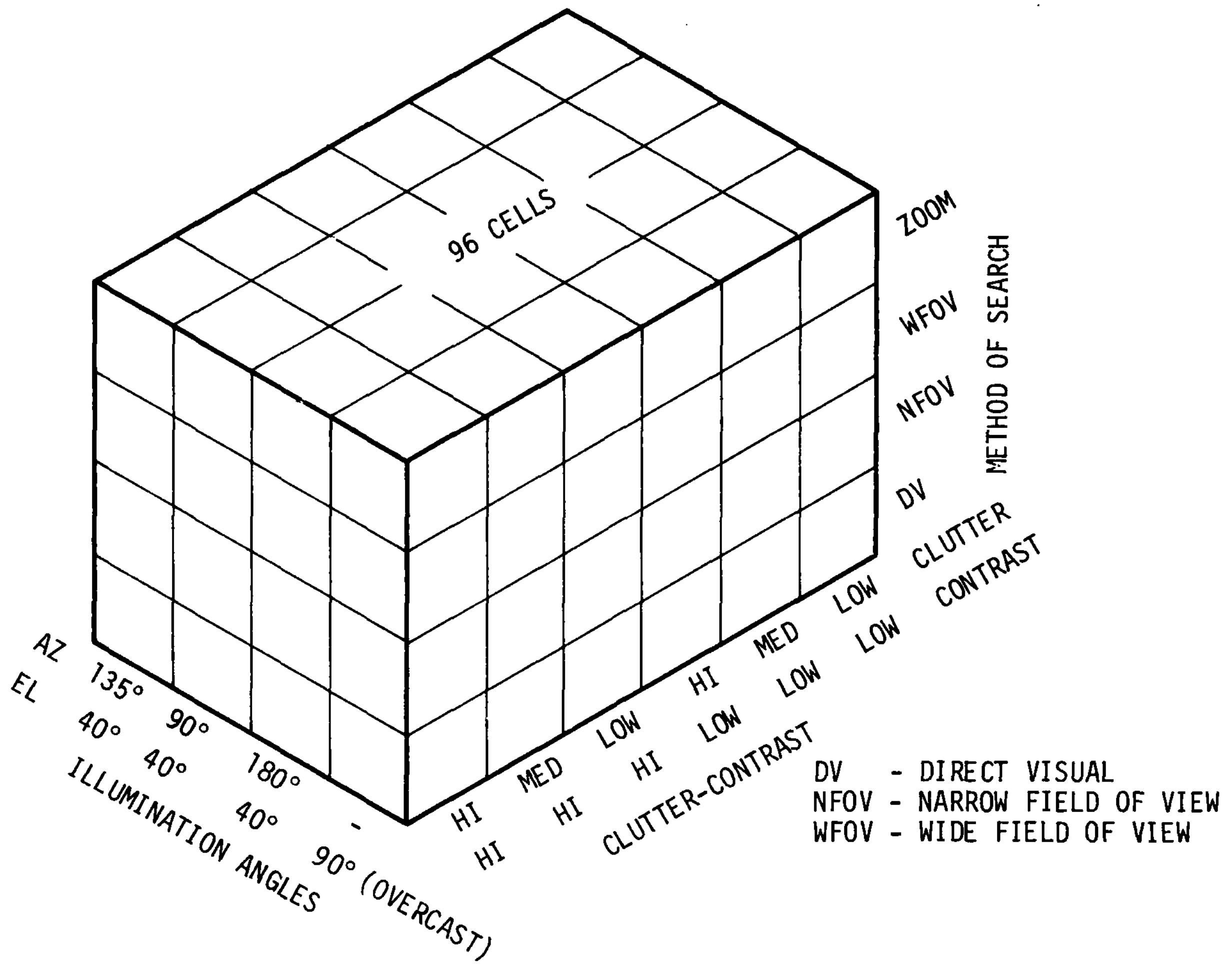
Sub-experiment 1, diagrammed in Figure 2-1, examined in detail the performance of four search methods under six different conditions of varying clutter/contrast combinations. Effects of terrain table location on performance were evaluated by replicating the six combinations of clutter/contrast through the six target zones, resulting in six table configurations. The four search methods used were:

1. Direct visual search without sensor aids
2. Direct visual search in parallel with search using a television sensor with a narrow (2 degrees) field-of-view (NF)
3. Direct visual search in parallel with search using a television sensor with a wide (8 degrees) FOV (WF)
4. Direct visual search in parallel with search using a television sensor using variable FOV (zoom lens, 8 to 2 degrees) (VF).

In all four search modes the Observer wore the Honeywell MOVTAS Helmet Sight. Unless the Observer selected track stick control, the helmet sight provided steering commands to the sensor gimbal. The Experimenter's TV display provided continuous sensor look angle information allowing the Experimenter to determine the Observer's look angle. The Observer's TV display was disabled when the direct view method of search was called for.

Two Observers, one trained and one untrained, ran identical run sets giving a total of 1152 experimental runs. One run was not completed. Inter-subject variability within the groups is not known.

(6 table configurations) x (4 search modes) x (6 clutter/contrast conditions) x (4 illumination conditions) x (2 Observers running identical runs) = 1152 experimental runs.



FACTORS CONSIDERED
- METHOD OF SEARCH - 4 TYPES
- CLUTTER - 3 LEVELS
- CONTRAST - 2 LEVELS
- ILLUMINATION - 4 LEVELS

OBSERVERS REQUIRED
- 32 FOR EACH OF 6 CONFIGURATIONS OF THE TABLE

MEASURES OF EFFECTIVENESS
- RANGE AT ACQUISITION
- PERCENT OF TARGETS ACQUIRED
- NUMBER OF FALSE ACQUISITIONS

NUMBER OF TARGETS
- 3 PER AREA

NUMBER OF EXPERIMENTAL RUNS
- (96 CELLS) x (6 TABLE CONFIGURATIONS) x (2 OBSERVERS RUNNING IDENTICAL RUN-SETS) = 1152 EXPERIMENTAL RUNS

Figure 2-1. Design of Sub-experiment 1

2.3 Hypotheses

Prior to the experiment, the following hypotheses relative to sub-experiment 1 were postulated (reference Project Plan IB1 of October 1974, Annex K, section 5).

1 Clutter will affect target acquisition in the order of best acquisition to worst as low, medium, and high

2 High contrast will produce better target acquisition than low contrast

3 Clutter will interact with contrast such that medium and high clutter conditions will differentially degrade target acquisition; at equivalent levels of contrast target acquisition will be lower with clutter

4 Effects of shadow will act to increase the effects of clutter; at low clutter condition shadow will aid target acquisition; at high clutter conditions shadow will reduce target acquisition performance

5 Overcast illumination will not interact significantly with clutter or contrast

6 Sun angle will improve target acquisition when it causes shadow to increase the lateral size of the target; target acquisition performance will be better at 90 degrees sun angle than at 0 or 180 degrees; 45 and 135 degrees sun angles will be better than 0 or 180 degrees but less than 90 degrees.

2.4 Method of Accomplishment

2.4.1 General Description

Each of the four search methods was used by different Observers against targets positioned on the terrain table.

The habitat was brought to the simulated altitude (3000 ft) and fixed in position. The run was started by the Experimenter at which time the curtain was raised and the terrain, starting at a slant range of 13 km, moved under the cockpit to simulate a flight velocity of approximately 400 knots. Each Observer made six separate runs. Each run posed a different search situation of clutter/contrast, while the illumination was maintained constant. The Experimenter monitored the Observer's search on the TV monitor at his station. Each run ended when the Observer signaled acquisition.

The instant that the Observer signaled acquisition, a curtain came down in front of him and the sensor; the range and time of the acquisition were recorded. The terrain and habitat were repositioned for the next run. Alternatively, the run was stopped by the Experimenter when the Observer had overflown his target.

At the end of each of the six runs, the Experimenter asked the Observer questions about the target (location, number, color, and direction) to verify correct acquisition. This information was recorded on the Experimenter Check Sheet and also entered into the computer through the use of the keyboard. Then the next run began.

The presence and positions of the sun simulator resulted in distinct changes in subject handling procedures in order to provide efficient experimentation.

1 On all overcast sky runs, each Observer was processed through targets 1 to 6, in order, and released

2 The sun simulator at azimuth 135 degrees and 180 degrees required a change of the simulator from one side of the model to the other during the run. This proved to be very time consuming. Several changes in sequence were attempted but the problem remained. Therefore, starting with terrain table configuration C, the straight-through order was restored for all sun positions and compensation was made by batching the Observers. For azimuths of 135 degrees and 180 degrees, a batch of four Observers was taken through 1 - 2 - 3, the sun simulator unit was repositioned, and the batch was put through 4 - 5 - 6. For azimuth 90 degrees this batch sequence became 1 - 2 - SC* - 3 - SC - 4 - 5 - SC - 6. These actions maintained the proper order and saved time.

2.4.2 Observers

Observer selection for sub-experiment 1 consisted of:

96 Martin Marietta (untrained Observers)

53 Air Force

31 Navy

12 Marines

192

*Solar simulator position charge

These runs were made from 9 December 1974 to 21 January 1975. One Martin Marietta Observer did not complete his sixth run due to equipment failure.

2.4.3 Terrain Table Layout

Sub-experiment 1 used terrain table configurations A, B, C, D, E, and F. Each configuration was divided into six separate target zones. Each zone represented a different combination of clutter/contrast. These combinations were rotated through the zones in the six configurations as shown in Table 2-I.

TABLE 2-I. CLUTTER/CONTRAST COMPOSITION OF CONFIGURATIONS A THROUGH F

Target Zone	A	B	C	D	E	F
I	LL	HH	MH	LH	HL	ML
II	ML	LL	HH	MH	LH	HL
III	HL	ML	LL	HH	MH	LH
IV	LH	HL	ML	LL	HH	MH
V	MH	LH	HL	ML	LL	HH
VI	HH	MH	LH	HL	ML	LL

Clutter was classified as either low, medium, or high. The levels of clutter were defined in terms of the number of target-like objects in the immediate vicinity of the target -- low clutter was represented by no trees in a 200 meter radius circle about the target; medium by 20 trees; and high by 60 trees.

The contrast of the individual targets with respect to their backgrounds took two levels: a low-contrast case in which the targets were only slightly darker than the background; and a high-contrast case, in which targets were considerably darker than the background.

Two different colors were used for the tank targets: dark O.D. (high contrast) and beige (low contrast). These two colors served throughout the experiment, providing contrasts within the required tolerances, since the terrain table surface (background) was fairly homogeneous. Contrast was defined as the difference between the luminances of the target and background divided by the luminance of the background, i.e., $C = (L_T - LB)/L_B$. Table 2-II summarizes the average contrast of the three target tanks with respect to the background in each target zone for each of the table configurations.

TABLE 2-II. NEGATIVE CONTRAST RATIO OF THE TARGETS IN THE DIFFERENT TARGET ZONES FOR CONFIGURATIONS A THROUGH F

Target Zone	Table					
	A	B	C	D	E	F
I	0.38	0.69	0.81	0.77	0.36	0.31
II	0.23	0.22	0.84	0.80	0.77	0.38
III	0.38	0.38	0.38	0.82	0.77	0.82
IV	0.71	0.37	0.34	0.42	0.77	0.78
V	0.64	0.64	0.30	0.28	0.27	0.71
VI	0.67	0.65	0.84	0.23	0.35	0.27

2.4.4 Illumination Conditions

Uniform lighting characteristics of overcast weather, as well as directional lighting characteristics of sunlight were simulated. Overcast weather was simulated using overhead fluorescent lighting producing 500 foot-candles at the terrain table surface. Clear sky weather was simulated using the sun simulator (also producing 500 foot-candles at the surface) to provide the different angles of illumination. Overhead fluorescent lighting (producing 100 foot-candles) provided the diffuse skylight effect.

Sub-experiment 1 used four different illumination conditions as shown in Table 2-III.

TABLE 2-III. ILLUMINATION CONDITIONS

Elevation	40 degrees	40 degrees	40 degrees[2]	90 degrees[3]
Azimuth[1]	90 degrees	180 degrees	135 degrees	-

[1] Azimuth (Az) is the direction of the sunlight taken from the position of the Observer, i.e., 180 degrees case, the Observer is looking into the sun.

[2] Due to equipment limitations, target zones I and IV for the El 40, Az 135 cases were run at an actual elevation of 32 degrees.

[3] Overcast sky conditions

2.4.5 Measures Used

For each individual run, the range and time of acquisition were recorded; valid as well as false acquisitions, and failures to acquire targets were also recorded.

2.5 Results

Two working procedures were used in the analysis of the data for sub-experiment 1:

1. Any correct acquisition made at the proper location was considered valid, regardless of how many tanks were reported at that location. Thus, when an Observer reported one, two, three, or more tanks at a proper location this was recorded as a valid target acquisition. Only valid acquisitions were considered in the statistical computations.

2. All data reporting mean range and the standard deviations thereof are based on the number of acquisitions made, and do not include unsuccessful acquisition attempts.

Results from sub-experiment 1 indicate that clutter was the most significant factor influencing target acquisition performance. In this experiment, 439 acquisitions were made out of 1151 attempts. Each of the 192 Observers made six runs, except for one Observer who missed one run due to equipment failure.

2.5.1 Analysis of Variance (General Linear Model)

The General Linear Model (GLM)/BMD10V (see Appendix D) was used to generate estimates for the missing cells for the analysis of variance (ANOVA). Results of the ANOVA are shown in Table 2-IV. Main effects and two-way interactions are included in the generated model. At the .05 level of significance, the main effects of terrain table (that is, variance in the terrain table configuration) and clutter and the two-way interactions of Observers versus terrain tables, terrain tables versus clutter, and illumination condition versus search method are significant. To test the impact of these effects, additional one- and two-way ANOVA were performed to help determine whether the differences could be more precisely located. These one- and two-way ANOVA were conducted using the actual recorded data and did not include BMD10V generated values. Thus, these analyses are probably more representative of the actual reported data.[1]

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[1] It should be noted as in Appendix D, paragraph 1.3, that the GLM, when implemented as the BMD10V program, loses creditability of estimated values when the data cells to be filled are grouped as a function of one or more variables. In the case of sub-experiment 1, unfilled cells are strongly grouped by clutter and search method.

TABLE 2-IV. SUB-EXPERIMENT 1 ANOVA
(GENERAL LINEAR MODEL)

Source	Sum of Squares	Degrees of Freedom	Mean Square	F Ratio
Table	36925575.35	5	7385115.07	2.43117*
Illumination Angle	12899474.87	3	4299824.95	1.41550
Assigned Search Method	10490307.46	3	3496769.15	1.15113
Observer	2377955.80	1	2377955.80	0.78282
Clutter	51642141.49	2	25821070.74	8.50027*
Contrast	9828578.45	1	9828578.45	3.23556
Table/Illumination Angle	72242298.42	15	4816153.22	1.58547
Observer/Table	59696909.58	51	1939281.91	3.93043*
Table/Clutter	83173370.14	10	8317337.01	2.73806*
Illumination Angle/ Assigned Search Method	62897861.68	9	6988651.29	2.30066*
Observer/Illumination Angle	10623872.70	3	3541290.90	1.16579
Illumination Angle/ Clutter	33750618.79	6	5625103.13	1.85178
Observer/Assigned Search Method	21339572.67	3	7113190.89	2.34165
Assigned Search Method/ Contrast	13082226.67	3	430742.22	1.43555
Observer/Contrast	9776759.75	1	9776759.75	3.21850
Clutter/Contrast	9029139.36	2	4514569.68	1.48619
Error	1111790098.22	366	3037677.00	

*Significant at .05 level

2.5.2 Primary Objectives

2.5.2.1 Search Method

The data for search method must be considered in two ways: first in terms of the assigned method, and second in terms of the actual method used. In the runs using terrain table configurations A and B, the actual method of search used by the Observer was not always recorded by the Experimenter after each run. This procedure was followed explicitly on all runs after terrain table configuration B was complete. Some of the actual search method data was also available from Experimenter Logs for table configurations A and B. However, any run in which the search method was not clearly recorded was not used in the analyses.

2.5.2.1.1 Assigned Search Method

The ANOVA indicated no significant difference among assigned search methods (Table 2-V). The direct view (DV) and wide field of view (WF) appear to be essentially the same, while the narrow (NF) and variable (VF) field of view conditions are alike. The result of a chi-square test of the number of acquisitions by assigned search method is not significant.

TABLE 2-V. ASSIGNED SEARCH METHOD (NO SIGNIFICANT DIFFERENCE $F(3,366) = 1.41$)

Assigned Search Method	Mean Range ($\bar{x}$)	Standard Deviation ($\hat{\sigma}$)	Sample Size N
DV	4349m	1726	115
DV + NF	4922m	2012	104
DV + WF	4436m	1976	113
SV + VF	4947m	2196	107

Chi-square ($\chi^2 = 1.16$, DF = 3) Not significant

The ANOVA presented in Table 2-IV indicated an interaction between the illumination angle and the assigned search method. Table 2-VI presents the two-way ANOVA for illumination angle versus assigned search method. Table 2-VII shows the mean detection ranges for the combinations of assigned search method and illumination angle. There is not a predictable pattern for the assigned search methods.

TABLE 2-VI. ANOVA ILLUMINATION ANGLE VERSUS ASSIGNED SEARCH METHOD

Source	Sum of Squares	Degrees of Freedom	Mean Square	F Ratio
Illumination Angle	25217852.85	3	8405950.95	2.24
Search Method	34662082.70	3	11554027.56	3.08*
Illumination Angle X Search Method	93572194.57	9	10396910.50	2.77*
Error	1589335402.32	423	3757294.09	

*Significant at .05 level

TABLE 2-VII. INTERACTION OF ASSIGNED SEARCH METHOD VERSUS ILLUMINATION ANGLE

Assigned Search Method	Illumination Angle			
	180 Degrees	135 Degrees	90 Degrees	Overcast
DV	4062m	4635m	4772m	3879m
DV + WF	3735m	3990m	5010m	4859m
DV + NF	5872m	4122m	5168m	4758m
DV + VF	5832m	4442m	4611m	4720m

2.5.2.1.2 Actual Search Method (terrain table configurations C, D, E, and F Only)

Table 2-VIII lists the results of the ANOVA for the actual search method as well as for the illumination angle interaction effects, which were shown as significant in Table 2-IV. Only the actual method of search is significant at the .05 level; there was no significant interaction between actual search method and illumination angle.

TABLE 2-VIII. ACTUAL SEARCH METHOD VERSUS ILLUMINATION ANGLE (TERRAIN TABLES C, D, E, AND F ONLY)

Source	Sum of Squares	Degrees of Freedom	Mean Square	F. Ratio
Search Method	32776679.20	3	10925559.73	3.28*
Illumination Angle	6461300.31	3	2153766.77	0.65
Search Method X Illumination Angle	46525221.38	9	5169469.04	1.55
Error	969364286.16	291	3331148.74	

*Significant at .05 level

Table 2-IX presents the actual search method data. The wide field had the longest range, followed closely by the variable field. The use of the narrow field, and direct visual methods produced acquisitions at markedly shorter ranges. As shown by the data, there was little difference in operator preference among the three sensors; however, the direct view was selected by a plurality of the Observers.

TABLE 2-IX. ACTUAL SEARCH METHOD (SIGNIFICANT DIFFERENCE $F(3,291) = 3.28$)

Assigned Search Method	Mean Range ($\bar{x}$)	Acquisitions	Misses
DV	4401m	130	213
DV + NF	4559m	55	87
DV + WF	5189m	56	66
DV + VF	4942m	66	95

Chi-square ($\chi^2 = 2.56$, $D_f = 3$) Not significant

2.5.2.2 Clutter

As indicated in Table 2-IV, the effect of clutter was significant at the .05 level. The high level of clutter produced the shortest acquisition range and the low level the longest. Also the chi-square test of the number of acquisitions showed a significant difference; as the level of clutter increased the number of acquisitions descreased. These results are shown in Table 2-X.

TABLE 2-X. EFFECT OF CLUTTER (SIGNIFICANT DIFFERENCE $F(2,366) = 8.50$)

Clutter Level	Mean Range ($\bar{x}$)	Standard Deviation ($\hat{\sigma}$)	Sample Size (N)
Low	5016m	2114	226
Medium	4410m	1773	125
High	4064m	1777	88

Chi-square ($\chi^2 = 102.8$, DF = 2) Significant

2.5.2.3 Contrast

The ANOVA presented in Table 2-IV using the GLM did not show contrast to be a significant factor although the high level of contrast showed a slightly longer acquisition range. Also no significance resulted from the chi-square test on the number of acquisitions. (More targets were found at the low level of contrast.) Table 2-XI shows the results from the two levels of contrast.

TABLE 2-XI. EFFECT OF CONTRAST (NO SIGNIFICANT DIFFERENCE $F(1,366) = 3.24$)

Contrast Level	Mean Range ($\bar{x}$)	Standard Deviation ($\hat{\sigma}$)	Sample Size (N)
Low	4508m	1931	242
High	4831m	2055	197

Chi-square ($\chi^2 = 7.125$, DF = 1) Not significant

2.5.3 Secondary Objectives

2.5.3.1 Illumination

As analyzed through the GLM (Table 2-IV), illumination angle had no significant effect on acquisition range; however, based on the chi-square test, illumination angle did influence the number of acquisitions. The overcast and 90 degree conditions produced more acquisitions than the 135 and 180 degree conditions. Table 2-XII shows the mean range, standard deviation, and number of acquisitions for various illumination conditions.

TABLE 2-XII. ILLUMINATION RESULTS (NO SIGNIFICANT DIFFERENCE $F(3,366) = 1.41$)

Sun Azimuth	Mean Range ($\bar{x}$)	Standard Deviation (σ)	Sample Size (N)
Overcast	4546m	1902	120
180	4821m	2308	97
135	4274m	1762	89
90	4879m	1944	133

Chi-square ($\chi^2 = 18.2$, DF = 3)
Significant

2.5.4 Additional Results

2.5.4.1 Terrain Table Configurations

The effects of terrain table configurations are significant as shown in Table 2-IV.

Table 2-XIII presents the results of the analysis of the six table configurations. The chi-square test also indicated a significant difference in the number of acquisitions by terrain table configuration. This is partially due to a change in briefing level, which is discussed in section 2.5.4.3.

TABLE 2-XIII. TERRAIN TABLE CONFIGURATION RESULTS
(SIGNIFICANT DIFFERENCE F(5,366) = 2.43)

Configuration	Mean Range ($\bar{x}$)	Standard Deviation ($\hat{\sigma}$)	Sample Size (N)
A	4682m	2460	66
B	4452m	2076	66
C	4083m	1870	54
D	4464m	1933	96
E	4898m	1613	93
F	5238m	1925	64

Configuration	Differences				
	B	C	D	E	F
A	NS	NS	NS	NS	NS
B	-	NS	NS	NS	*
C	-	-	NS	*	*
D	-	-	-	NS	*
E	-	-	-	-	NS
F	-	-	-	-	-

NS = Not Significant
* = Significant

Chi-square (χ^2 = 32.4, DF = 5) Significant

The ANOVA in Table 2-IV shows a significant interaction between clutter and terrain table configurations. A two-way ANOVA for these factors is shown in Table 2-XIV.

Table 2-XV shows the effects on mean acquisition range of clutter and terrain table configuration. The effect of clutter followed the expected pattern in terrain table configurations A, D, E, and F; that is, the higher the clutter the shorter the detection range, although table configuration E produced no great difference in ranges. In table configuration B, the expected pattern was reversed; that is, the highest clutter produced the longest detection range and the lowest clutter, the shortest detection ranges. In table configuration C, the medium level of clutter produced the longest detection ranges, although they were not significantly different from those achieved with the low clutter level.

TABLE 2-XIV. ANOVA TERRAIN TABLE VERSUS CLUTTER

Source	Sum of Squares	Degrees of Freedom	Mean Square	F Ratio
Terrain Table Configuration	43487456.13	5	8697491.22	2.43*
Clutter	45060919.84	2	22530459.92	6.30*
Table Configuration X Clutter	110731404.31	10	11073140.43	3.10*
Error	1005197346.43	421	3575290.60	

*Significant at the .05 level

TABLE 2-XV. CLUTTER BY TERRAIN TABLE CONFIGURATION

Configuration	Clutter		
	Low	Medium	High
A	5883m	3883m	3177m
B	4135m	4497m	5609m
C	4226m	4403m	3519m
D	5115m	4030m	3604m
E	4981m	4823m	4791m
F	5753m	5026m	4233m

The effects of clutter and contrast were also analyzed by the number of correct acquisitions by terrain table configurations. Table 2-XVI shows the results for clutter, while Table 2-XVII shows the results for contrast. At the .05 level, the chi-square test showed no significant difference for the totals in either clutter or contrast.

TABLE 2-XVI. EFFECTS OF CLUTTER ON ACQUISITIONS

Configuration	Clutter			Chi-Square	Degrees of Freedom
	Low	Medium	High		
A	32	18	16	10.5	2*
B	39	17	10	31.7	2*
C	28	12	14	11.8	2*
D	45	34	17	24.9	2*
E	47	30	16	30.2	2*
F	35	14	15	19.7	2*

Chi-square (χ^2 = 8.72, DF = 10) Not Significant
*Significant at the .05 level.

TABLE 2-XVII. EFFECTS OF CONTRAST ON ACQUISITIONS

Configuration	Contrast		Chi-Square	Degrees of Freedom
	Low	High		
A	34	32	0.023	1
B	35	31	0.208	1
C	29	25	0.232	1
D	58	38	7.52	1*
E	53	40	3.00	1
F	33	31	0.023	1

Chi-square (χ^2 = 2.06, DF = 5) Not Significant
*Significant at the .05 level.

Examining clutter within terrain table configurations showed that the effect of clutter is significant for all configurations. However, only terrain table configuration D showed a significant inverse difference for contrast. In terrain table configurations D and E, more targets were detected at the low level of contrast while for the other four configurations the number of acquisitions were essentially the same for both levels of contrast.

2.5.4.2 Observer Differences

There were no significant differences in Observer range performance as indicated in the ANOVA (Table 2-IV). The result of a chi-square test of number of correct targets for trained versus untrained Observers is significant with the trained observers identifying 23 percent more targets. The trained Observers acquired more targets, but their mean range was not significantly different from that of the untrained Observers. Table 2-XVIII presents the data for the Observers.

TABLE 2-XVIII. OBSERVER RESULTS (NOT SIGNIFICANT $F(1,366) = 0.78$)

Observers	Range Mean ($\bar{X}$)	Standard Deviation ($\hat{\sigma}$)	Sample Size (N)
Untrained	4714m	1989	197
Trained	4603m	1997	242

Chi-square ($\chi^2 = 7.12$, DF = 1)
Significant

The ANOVA did indicate an interaction of Observers with terrain table configurations. In terrain table configurations B, C, and F the untrained Observers acquired targets at greater ranges but the trained Observers acquired more targets. In table configurations D and E, the trained Observers performed better all around, while in table configuration A there was no significant difference between the trained and untrained Observer. The chi-square test of the number of correct targets by table configuration for trained versus untrained Observers was not significant. Table 2-XIX shows these data.

2.5.4.3 Briefing Level

Briefing level was not originally planned as a variable, but analysis of the results of table configuration A made it obvious that the briefing used was inadequate. Subjects were briefed initially to a 3-square kilometer area but the rate of acquisition was too low to provide enough data on which to base statistically valid results. A recommendation was made to the SEEKVAL Program Office to change the briefing level to a 1-square kilometer level halfway through the experiment. Upon approval, this change was made at the end of terrain table configuration C. Results of the change of briefing are shown in Tables 2-XX and 2-XXI. The 1-square kilometer briefing level improved performance in number of acquisitions for terrain table configurations D and E but not for E.

TABLE 2-XIX. TARGET ACQUISITION BY TERRAIN TABLE CONFIGURATION

Configuration	Experience								
	Untrained			Trained			Totals		
	Mean Range ($\bar{x}$)	Sigma ($\hat{\sigma}$)	N	Mean Range ($\bar{x}$)	Sigma ($\hat{\sigma}$)	N	Mean Range ($\bar{x}$)	Sigma ($\hat{\sigma}$)	N
A	4688m	2104	34	4675m	2824	32	4682m	2460	66
B	5039m	2174	31	3932m	1865	35	4452m	2076	66
C	4899m	2105	19	3639m	1590	35	4083m	1870	54
D	4390m	2118	47	4533m	1756	49	4464m	1933	96
E	4204m	1216	44	5520m	1682	49	4898m	1613	93
F	5846m	2060	22	4920m	1793	42	5238m	1925	64
Total	4714m	1989	197	4603m	1997	242	4653m	1992	439

Chi-square (χ^2 = 7.07, DF = 5) Not significant

TABLE 2-XX. BRIEFING LEVEL

Configuration	Acquisitions	Miss
A, B, C	186	390
D, E, F	253	323

Chi-square (χ^2 = 21.1, DF = 1)
Significant

TABLE 2-XXI. EFFECT OF BRIEFING LEVEL ON ACQUISITION

Configuration	Briefing Level		Possible Acquisitions	Rate
	3-km^2	1-km^2		
A	66	-	192	0.34
B	66	-	191	0.35
C	54	-	192	0.28
D	-	96	192	0.50
E	-	93	192	0.48
F	-	64	192	0.33
Total	186	253	1151	0.38

2.6 Conclusions

In sub-experiment 1 only 439 of 1151 acquisition attempts were successful. Therefore, the results of the analysis of variance must be viewed with caution. More emphasis should be put on the results of the χ^2 analysis.

2.6.1 Method of Search

The primary objective of sub-experiment 1 of the IB1 experiment was to compare effectivity of direct visual as a means of target acquisition versus visual search aided by electro-optical/TV sensors. It is apparent from this experiment that when the use of the visual aids was optional, Observers preferred the DV method. When the Observer used the assigned search method, DV + VF and DV + WF methods provided acquisition at greater ranges than DV or DV + NF methods (Table 2-IX). This indicates that a combination of some magnification and a reasonably large FOV possibly aided the acquisition process.

The secondary objective of sub-experiment 1 was to demonstrate the utility of terrain tables as a tool for the evaluation of alternative target acquisition systems and techniques. In as much as varied results were obtained regarding the degree of significance of a wide number of variables, the utility of terrain tables for such purposes had been demonstrated. However, the relative utility to studies made in the real world cannot be determined until comparable studies are conducted under actual field conditions and comparative analyses are made.

2.6.2 Hypothesis Correlation

1 Clutter - Clutter significantly influenced target acquisition in approximately two-thirds of the runs, with increasing levels of clutter decreasing acquisition range, although table configuration reversed the trend and in terrain table configuration E the degree of clutter had little effect upon acquisition capability. Therefore, the hypothesis as stated is generally supported.

2 Contrast - The degrees of contrast used in sub-experiment 1 appear significant with an inverse exception of terrain table configuration D, in which case low contrast resulted in a significantly greater number of acquisitions. Generally, greater ranges were noted for high contrast, but more acquisitions were made with low contrast. The hypothesis is not supported.

3 Clutter/Contrast Interaction - According to the two-way ANOVA for clutter versus contrast, the GLM did not show a significant F ratio. The hypothesis is not supported in regard to interaction between clutter and contrast, although the hypothesis statements regarding clutter are generally supported.

4 Illumination Angle - Illumination angle was a secondary objective of sub-experiment 1 and when treated alone as a main effect resulted in an F ratio which was not significant by the GLM; however, the chi-square test produced a significant result in terms of acquisitions achieved. However, the no-shadow condition and the most visible shadow (90 degree sun angle) were the higher scoring conditions. Also, no apparent interaction was noted between illumination angle and search method. The hypothesis that the effects of shadow would increase the effects of clutter was not supported by the GLM data as shown in Table 2-IV.

5 Overcast Illumination - This hypothesis is supported.

6 Sun Angle - A chi-square test showed significant difference in the number of acquisitions between overcast, or sun angles of 180, 135, or 90 degrees. More acquisitions were made at 90 degrees and in overcast than at 135 or 180 (0 azimuth was not available). However there was no significant difference in range at acquisition. The hypothesis, as stated, is therefore not supported.

2.6.3 Additional Results and Conclusions

1 Terrain Table Configurations - The chi-square test indicated that terrain table configurations produced a significant effect on acquisition of targets. An in-depth study of this effect was not included in the scope of work.

2 Observer Differences - Although the mean range of acquisition was nearly the same for both trained and untrained Observers, the trained Observers acquired a greater number of targets to a significant degree. The chi-square test developed a definite superiority in the ability of trained observers to identify more targets. Inter-subject variability within groups was not addressed and could have influenced this result. Section 2.5.4 delineates some interaction between terrain table configurations and Observer training. However, no particular conclusions can be statistically identified with the available data.

3 Briefing Level - Due to the insufficient quantity of useful data obtained when Observers were briefed to search the entire target zone, a request was submitted and approved to change this to a 1-square kilometer search area, effecting a considerable increase in statistically useful information. Even though this tended to slightly degrade the validity of some comparisons, it is believed that the data obtained is sufficiently accurate to justify the conclusions stated

herein. The change in briefing level was made at the end of the runs on terrain table configuration C. For configurations D and E there was a significant increase in number of targets detected. However, for configuration F the number was approximately the same as before which was primarily due to lesser performance by the untrained Observers. The change in briefing level did tend to help target acquisition.

3.0 SUB-EXPERIMENT 2

3.1 Objectives

As stated in the IB1 Project Plan the primary objectives of sub-experiment 2 were to determine target acquisition performance as a function of:

1 Method of search

2 Number of targets per zone.

The secondary objectives were determination of acquisition performance as a function of:

1 Target area clutter

2 Target-to-background contrast.

3.2 Experimental Design

The experiment examined in detail the performance of four search methods under six different conditions of varying clutter/contrast combinations and using four different target array conditions. These four search methods were:

1 Direct visual search without sensor aids

2 Direct visual search in parallel with search using a television sensor on a narrow (2 degrees) FOV (NF)

3 Direct visual search in parallel with search using a television sensor on a wide (8 degrees) FOV (WF)

4 Direct visual search in parallel with search using a television sensor using a variable FOV (zoom lens, 8 to 2 degrees) (VF).

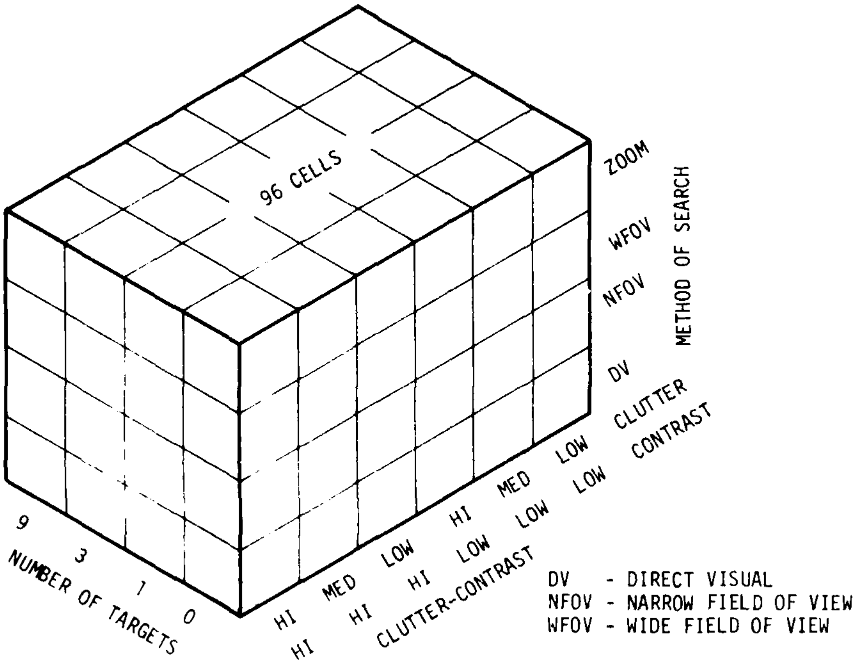
Two Observers, one trained and one untrained, ran identical run sets, giving a total of 192 experimental runs.

The experimental design is shown in Figure 3-1.

(1 table configuration) x (4 search modes) x (6 clutter/contrast conditions) x (4 target array conditions) x (2 Observers running identical runs) = 192 experimental runs.

3.3 Hypotheses

Prior to the experiments, the following hypotheses relative to sub-experiment 2 were postulated (reference Project Plan IB1 of October 1974, Annex K, Section 5).



FACTORS CONSIDERED
- METHOD OF SEARCH - 4 TYPES
- CLUTTER - 3 LEVELS } UNVARIED
- CONTRAST - 2 LEVELS }
- NUMBER OF ELEMENTS IN TARGET ARRAY - 4 LEVELS

OBSERVERS REQUIRED
- 8 FOR EACH OF 4 SETS OF RUNS

MEASURES OF EFFECTIVENESS
- RANGE AT ACQUISITION
- PERCENT OF TARGETS ACQUIRED
- NUMBER OF FALSE ACQUISITIONS

NUMBER OF TARGETS
- VARIABLE 0, 1, 3, 9

NUMBER OF EXPERIMENTAL RUNS
- (96 CELLS) x (1 TABLE CONFIGURATION) x
- (2 OBSERVERS RUNNING IDENTICAL RUNS) -
- 192 EXPERIMENTAL RUNS

Figure 3-1. Design of Sub-experiment 2

1 Clutter will affect target acquisition in the order of best acquisition to worst as low, medium, and high

2 High contrast will produce better target acquisition than low contrast

3 Clutter will interact with contrast such that medium and high clutter conditions will differentially degrade target acquisition; at equivalent levels of contrast target acquisition will be lower with clutter.

Not stated, but implicit in the design of this sub-experiment, is the hypothesis that number of targets will influence acquisition performance such that higher target numbers will produce better performance.

3.4 Method of Accomplishment

3.4.1 General Description

Each of the four search methods was used by different Observers against targets positioned on the terrain table.

The habitat was brought to the simulated altitude (3000 feet) and fixed in position. The run was started by the Experimenter at which time the curtain was raised and the terrain, starting at a slant range of 13 km, moved under the cockpit to simulate a flight velocity of approximately 400 knots. Each Observer made six separate runs. Each run posed a different situation of clutter/contrast and number of elements in target array, while the illumination was maintained constant (overcast condition). The Experimenter monitored the Observer's search on the TV monitor at his station. Eight Observers - two for each search method - completed run sets over the terrain table, with the different numbers of targets in the different zones. Next, the number of targets in each zone was changed to another level, and a second set of eight Observers made runs over the terrain table. This pattern was repeated until four sets of runs were completed: four target zones had each level of the variable number of targets and two target zones had two repeated values. Each run ended when the Observer signaled acquisition.

The instant that the Observer signaled acquisition, a curtain came down in front of him and the sensor; the range and time of the acquisition were recorded. The terrain and habitat were repositioned for the next run. The run was stopped by the Experimenter when the Observer had overflown his target.

At the end of each of the six runs, the Experimenter asked the Observer questions about the target (location, number, color, and direction) to verify correct acquisition. This information was recorded on the Experimenter Check Sheet and also entered into the computer through the use of the keyboard. Then the next run began.

3.4.2 Observers

Observer selection for Experiment 2 consisted of:

16	Martin Marietta
5	Air Force
10	Navy
1	Marine
32	

The runs were made from 29 January to 2 February 1975.

3.4.3 Terrain Table Layout

The sub-experiment utilized one of the six terrain table configurations that were used in sub-experiment 1 (Configuration F). Therefore, all six combinations of clutter and contrast were used, one for each of the six target zones as shown in Table 3-I, but the effects of these variables were not separable from the effects of other characteristics of the individual target zones. Only one type of illumination was used in the sub-experiment: overcast. The numbers of target elements located in the target zones were none, one, three, and nine; the numbers of targets were rotated through the six zones as shown in Table 3-II.

TABLE 3-I. COMPOSITION OF CONFIGURATION F

Target Zone	I	II	III	IV	V	VI
Clutter/contrast	ML	HL	LH	MH	HH	LL

Clutter was classified as either low, medium, or high. The levels of clutter were defined in terms of the number of target-like objects in the immediate vicinity of the target -- low clutter was represented by no trees in a 200 meter radius circle about the target; medium by 20 trees; and high by 60 trees.

The contrast of the individual targets with respect to their backgrounds took two levels: a low-contrast case in which the targets were only slightly darker than the background; and a high-contrast case, in which targets were considerably darker than the background.

Two different colors were used for the tank targets: dark O.D. (high contrast) and beige (low contrast). Contrast was defined as the difference between the luminance of the target and background divided by the luminance of the background, i.e., $C = (L_T - L_B)/L_B$. Table 3-II shows the average contrast of the tanks in each target zone with respect to the background for the four table sub-configurations used.

TABLE 3-II. NEGATIVE CONTRAST RATIO OF THE TARGETS AND NUMBER OF TANKS IN EACH ZONE

Target Zone	Configuration F_1		Configuration F_2		Configuration F_3		Configuration F_4	
	Number of Tanks	Contrast Ratio	Number of Tanks	Contrast Ratio	Number of Tanks	Contrast Ratio	Number of Tanks	Contrast Ratio
I	0	-	9	0.35	3	0.40	1	0.36
II	1	0.33	3	0.34	1	0.36	3	0.40
III	3	0.73	1	0.78	3	0.81	1	0.73
IV	1	0.79	0	-	9	0.78	3	0.73
V	3	0.79	1	0.79	0	-	9	0.79
VI	9	0.27	3	0.28	1	0.67	0	-

3.4.4 Illumination Conditions

Overhead fluorescent lighting simulating an overcast condition was used for all runs in sub-experiment 2.

3.4.5 Measures Used

For each individual run, the range and time of acquisition were recorded; valid as well as false acquisitions and failures to acquire targets were also recorded.

3.5 Results

Two working procedures were used in the analysis of the data for sub-experiment 2:

1 Any correct acquisition made at the proper location was considered valid, regardless of how many tanks were reported at that location except when the target zone contained no tanks. Thus when an observer reported any number of tanks at a proper location actually containing 1, 3, or 9 tanks this was recorded as a valid target acquisition. In the zero tanks case, only a negative report was considered valid. Ultimately, the zero tank case had to be discarded due to limitations in the experimental procedures which precluded any meaningful treatment of those data (see discussion in 3.5.2.2). In the analyses that follow only valid acquisitions are

considered in the statistical computations. Target number is considered in a separate analysis of that variable.

2 All data reporting mean range and the standard deviations thereof are based upon the number of acquisitions made, and do not include unsuccessful acquisition attempts.

The two primary objectives of sub-experiment 2 were the effects of method of search and effects of the number of targets per zone. Secondary objectives were effects of clutter and contrast; an additional variable was Observer training. In this sub-experiment a total of 32 Observers made 83 acquisitions. However, 21 of these were in the zero target condition, for which the range value was indeterminate. The following paragraphs describe the analysis performed in sub-experiment 2 data.

3.5.1 Analysis of Variance

Table 3-III presents the results of the overall ANOVA using the GLM conducted for this experiment. In this analysis the zero target condition is excluded because in most zero target cases the experiment ran to the minimum range (i.e., the Observer was over or beyond the target when the run was terminated by the Experimenter). Only clutter was found to be significant, as discussed in Section 3.5.3. Targets per zone became a significant factor when the zero case was introduced.

TABLE 3-III. ANOVA SUB-EXPERIMENT 2 (GLM) (WITHOUT ZERO TARGET CONDITION)

Source	Sum of Squares	Degrees of Freedom	Mean Square	F Ratio
Assigned Search Method	7512490.01	3	2504163.33	0.82
Clutter	27339069.83	2	13609534.91	4.45*
Contrast	1405911.37	1	1405911.37	0.46
No. Targets	7104905.52	2	3552452.76	1.16
Observers	8088418.01	1	8088418.01	2.63
Error	159747836.07	52	3072073.00	

*Significant at the .05 level

3.5.2 Primary Objectives

3.5.2.1 Search Method

3.5.2.1.1 Assigned Search Method

There were no significant F ratio differences in target acquisition, either in range or in number of correct acquisitions, when grouped by assigned search method. Table 3-IV shows those results, which includes the correctly reported zero-target locations. Table 3-V presents the same data but the zero target cases have been excluded.

TABLE 3-IV. TARGET ACQUISITION BY ASSIGNED SEARCH METHOD (INCLUDING ZERO TARGET CONDITION)

Assigned Search Method	Mean Range ($\bar{x}$)	Standard Deviation ($\hat{\sigma}$)	Number of Acquisitions
DV	3655m	2524	24
DV + NF	3535m	1970	24
DV + WF	3882m	1892	22
DV + VF	4094m	2271	13

Chi-square (χ^2 = 7.02, DF = 3) Not Significant

TABLE 3-V. TARGET ACQUISITION BY ASSIGNED SEARCH METHOD (LESS ZERO TARGET CONDITION)

Assigned Search Method	Mean Range ($\bar{x}$)	Standard Deviation ($\hat{\sigma}$)	Number of Acquisitions
DV	4589 m	2437	17
DV + NF	4239 m	1769	18
DV + WF	4566m	1569	17
DV + VF	4817m	2085	10

Chi-square (χ^2 = 4.32, DF = 3) Not Significant

3.5.2.1.2 Actual Search Method

When questioned as to search method actually used, there was a stated preference for the direct visual mode. Several Observers who were assigned the DV + NF and DV + WF modes did not use the aid at all. These data are shown in Tables 3-VI and 3-VII. The difference in acquisition range is not significant for the actual search mode. In fact, the actual search method is not markedly different from the assigned search method in acquisition range.

TABLE 3-VI. TARGET ACQUISITION BY ACTUAL SEARCH METHOD (WITH ZERO TARGET CONDITION)

Search Method	Mean Range ($\bar{x}$)	Standard Deviation ($\hat{\sigma}$)	Sample Size (N)	Misses
DV	3703m	2172	38	47
DV + WF	3680m	1863	17	17
DV + NF	3595m	2350	16	13
DV + VF	4201m	2338	12	32

Chi-square (χ^2 = 6.96, DF = 3) Not significant

TABLE 3-VII. TARGET ACQUISITIONS BY ACTUAL SEARCH METHOD (WITHOUT ZERO TARGET CONDITION)

Search Method	Mean Range ($\bar{x}$)	Standard Deviation ($\hat{\sigma}$)	Sample Size (N)	Misses
DV	4391m	2033	29	43
DV + WF	4366m	1554	13	15
DV + NF	4606m	2158	11	12
DV + VF	5039m	2081	9	28

Chi-square (χ^2 = 4.81, DF = 3) Not significant

3.5.2.2 Number of Targets

The data in Table 3-III indicate no significance for the number of targets in the zone, whereas the chi-square test result is significant in Table 3-VIII. Table 3-VIII shows definite improvement in range at acquisition as the number of targets per zone is increased from 1 to 3 to 9. However, the relatively high number of correct zero target condition acquisitions (when compared with the overall rate of acquisition for this experiment and for sub-experiment 1) was not expected. For this reason, the correct zero acquisition situation was explored in some depth. The range values quoted for these acquisitions could have no statistical significance whatever since they merely represented the point at which the Experimenter had terminated the run, with the area penetrated as far as possible.

TABLE 3-VIII. TARGET ACQUISITIONS FOR TARGETS PER ZONE

Targets/ Zone	Mean Range ($\bar{x}$)	Standard Deviation ($\hat{\sigma}$)	Sample Size (N)
0	1840m	467	21
1	3626m	1692	16
3	4819m	2179	30
9	4846m	1443	16

Chi-square (χ^2 = 16.15, DF = 3) Significant

Since the experimental procedures did not provide for briefing the Observer to expect a zero target case they were not briefed to terminate a run with any form of a negative report. Rather, their target zone briefing "...tanks have been reported in the area..." would tend to motivate them to continue their search as long as possible. Thus, the zero target case could have no commonality of meaning, either in range or number of valid acquisitions, with the 1, 3, and 9 target cases.

3.5.3 Secondary Objectives

3.5.3.1 Clutter

The ANOVA in Table 3-III showed clutter to be significant. Table 3-IX shows the results for clutter without the zero-target condition and Table 3-X, with the zero-target condition. As the level of clutter increased the detection range and the number of detections decreased, although the number of detections at the medium and high levels are not significantly different from each other.

TABLE 3-IX. EFFECT OF CLUTTER (WITHOUT ZERO TARGET CONDITION)

Level	Mean Range ($\bar{x}$)	Standard Deviation ($\hat{\sigma}$)	Sample Size (N)
Low	5197m	1900	28
Medium	4658m	1769	18
High	3173m	1557	16

Chi-square (χ^2 = 5.46, DF = 2) Not significant

TABLE 3-X. EFFECT OF CLUTTER (WITH ZERO TARGET CONDITION)

Level	Mean Range ($\bar{x}$)	Standard Deviation ($\hat{\sigma}$)	Sample Size (N)
Low	4526m	2172	35
Medium	3726m	2135	25
High	2593m	1572	23

Chi-square (χ^2 = 5.26, DF = 2) Not significant

3.5.3.2 Contrast

Tables 3-XI and 3-XII show the results for contrast. Although the ANOVA did not show a significant difference, there is a tendency to find more targets at the low level of contrast. High contrast enabled acquisition at somewhat longer ranges. Table 3-XII is included only to show the effects of incorporating the zero target case on the data. Obviously, contrast has no meaning when there are no targets present.

TABLE 3-XI. EFFECTS OF CONTRAST (WITHOUT ZERO TARGET CONDITION)

Level	Mean Range ($\bar{x}$)	Standard Deviation ($\hat{\sigma}$)	Sample Size (N)
Low	4117m	1745	40
High	5247m	2096	22

Chi-square (χ^2 = 7.16, DF = 1) Significant

TABLE 3-XII. EFFECTS OF CONTRAST (WITH ZERO TARGET CONDITION)

Level	Mean Range ($\bar{x}$)	Standard Deviation ($\hat{\sigma}$)	Sample Size (N)
Low	3585m	1855	51
High	4011m	2543	32

Chi-square (χ^2 = 6.88, DF = 1) Significant

The effects of clutter/contrast are very much the same as those found in sub-experiment 1. Table 3-XIII reports these results with the zero target condition omitted from the data, i.e., 62 acquisitions only. The difference between the values are significant, however, using the chi-square test.

TABLE 3-XIII. EFFECT OF CLUTTER/CONTRAST (EXCLUDING ZERO TARGET CONDITIONS)

Clutter/ Contrast	Mean Range ($\bar{x}$)	Standard Deviation ($\hat{\sigma}$)	Number Acquisitions
LL	4643m	1414	14
ML	5021m	1847	11
HL	2963m	1355	15
LH	5750m	2199	14
MH	4086m	1597	7
HH	6332m*		1

*Only one acquisition
Chi-square (χ^2 = 27.00, DF = 5) Significant

The number of targets positioned in a specific area tends to interact with the clutter in that area. In Table 3-XIV, the effect of clutter on target number is indicated. An apparent anomaly in these results is the zero target case (see the discussion of number of targets under 3.5.2.2).

TABLE 3-XIV. TARGET ACQUISITIONS IN CLUTTER CONDITIONS BY NUMBER OF TARGETS IN AREA

Clutter Condition	Targets in Area											
	0			1			3			9		
	Acquisitions	Trials	Percent	Acquisitions	Trials	Percent	Acquisitions	Trials	Percent	Acquisitions	Trials	Percent
Low	7	8	88	6	24	25	17	24	71	5	8	63
Medium	7	16	44	3	16	19	5	16	31	10	16	63
High	7	8	88	7	24	29	8	24	33	1	8	12

3.5.4 Additional Results

3.5.4.1 Observer Differences

Trained Observers made 45 correct acquisitions, untrained made 38. (Note that reporting one or more targets in a zone is a valid acquisition except for the zero-target case where "no target" is correct). Omitting the zero-target case, trained Observers made 34 acquisitions with a mean range of acquisition of 4890 meters and a standard deviation of 2030. For untrained Observers the range was 4066 with a standard deviation of 1750 with 28 acquisitions. The differences are not statistically significant, although trained Observers performed somewhat better. Knowledge of inter-subject variability was not obtained.

3.6 Conclusions

3.6.1 Primary Objectives

1 Method of search - The primary objective of sub-experiment 2 of the IB1 program was to determine whether direct visual search was a more effective means of target acquisition than visual search aided by electro-optical/stabilized sensors. However, to comply with the primary objectives of Experiment IB1 and this sub-experiment, both assigned search method and actual search method used were examined. When the test results were analyzed, including the zero-target areas (Table 3-IV), and then excluding the zero-target areas (Table 3-V), the longest range at acquisition was obtained with the DV + VF method. This was true for both the assigned search method and the actual search method. However, under the assigned search method, the DV + VF method produced the least number of acquisitions of all four search methods (Tables 3-IV and 3-V), whereas the actual search method data showed the

least acquisitions by the DV + NF method (Tables 3-VI and 3-VII). The results of sub-experiment 2 must be considered inconclusive as pertains to the primary objective of method of search.

2 Number of Targets per Zone - This factor was a primary objective of sub-experiment 2, and therefore was explored in some depth even though the ANOVA in Table 3-III showed no significant F-ratio for the number of targets per zone. Table 3-VIII shows that the range at target acquisition was significantly better for the greater number of targets (3 to 9) located in a zone. However, there were more acquisitions with three targets per zone than with one or nine per zone. The test design calling for the number of attempts in this sub-experiment to be much smaller than the other sub-experiments could be a contributing factor to the inconclusiveness of these results.

3.6.2 Secondary Objectives

1 Clutter/Contrast - Clutter was investigated both with and without zero-target conditions, and according to the ANOVA shown in Table 3-III, it was the only factor determined to be significant for this sub-experiment. Both parameters of range at acquisition and number of acquisitions were influenced by the amount of clutter used in these runs. As the clutter increased, the range was decreased and the number of acquisitions was reduced. The interaction of clutter and contrast produced results similar to those in sub-experiment 1, in that under both low and high contrast conditions performance is reduced as clutter increases. It would appear that clutter produced a definitely stronger influence than contrast under the conditions established for sub-experiment 2.

3.6.3 Hypotheses Correlations

1 Clutter - This hypothesis has been supported by the discussion under Secondary Objectives, Paragraph 3.6.2,1.

2 Contrast - This hypothesis has not been supported to any measurable degree since the high contrast produced acquisition at greater ranges but in lesser numbers of acquisition than the conditions of low contrast.

3 Clutter/Contrast Interaction - The first portion of this hypothesis is supported in regard to range at acquisition but not supported in number of acquisitions, as shown in Table 3-XIII. However, the second part of the hypothesis is not supported when all three levels of clutter are examined in Table 3-XIV pertaining to interaction of clutter and contrast.

3.6.4 Additional Conclusions

A comparison of the performances made by trained Observers versus those of untrained Observers was accomplished even though no significance was shown by the ANOVA in Table 3-III. The overall data for this sub-experiment shows that trained Observers made a greater number of valid acquisitions. When the zero-target conditions were omitted from the computations, the results showed that the range at acquisition was considerably greater for the trained Observers, but the number of acquisitions was only moderately improved over the untrained Observers. The performance of trained Observers exceeded that of untrained Observers in sub-experiment 2. The degree of homogeneity within either particular group is not known.

4.0 SUB-EXPERIMENT 3

4.1 Objectives

As stated in the IB1 Project Plan the primary objectives of sub-experiment 3 were to determine target acquisition performance as a function of:

1 Method of search

2 Illumination angles other than those used in sub-experiment 1.

Secondary objectives were to measure acquisition performance as a function of:

1 Target area clutter

2 Target-to-background contrast.

4.2 Experimental Design

The experiment examined in detail the performance of four search methods under six different conditions of varying clutter/contrast combinations and using six different illumination conditions, as shown in Figure 4-1. The four search methods were:

1 Direct visual search without sensor aids

2 Direct visual search in parallel with search using a television sensor with a narrow (2 degrees) FOV (NF)

3 Direct visual search in parallel with search using a television sensor with a wide (8 degrees) FOV (WF)

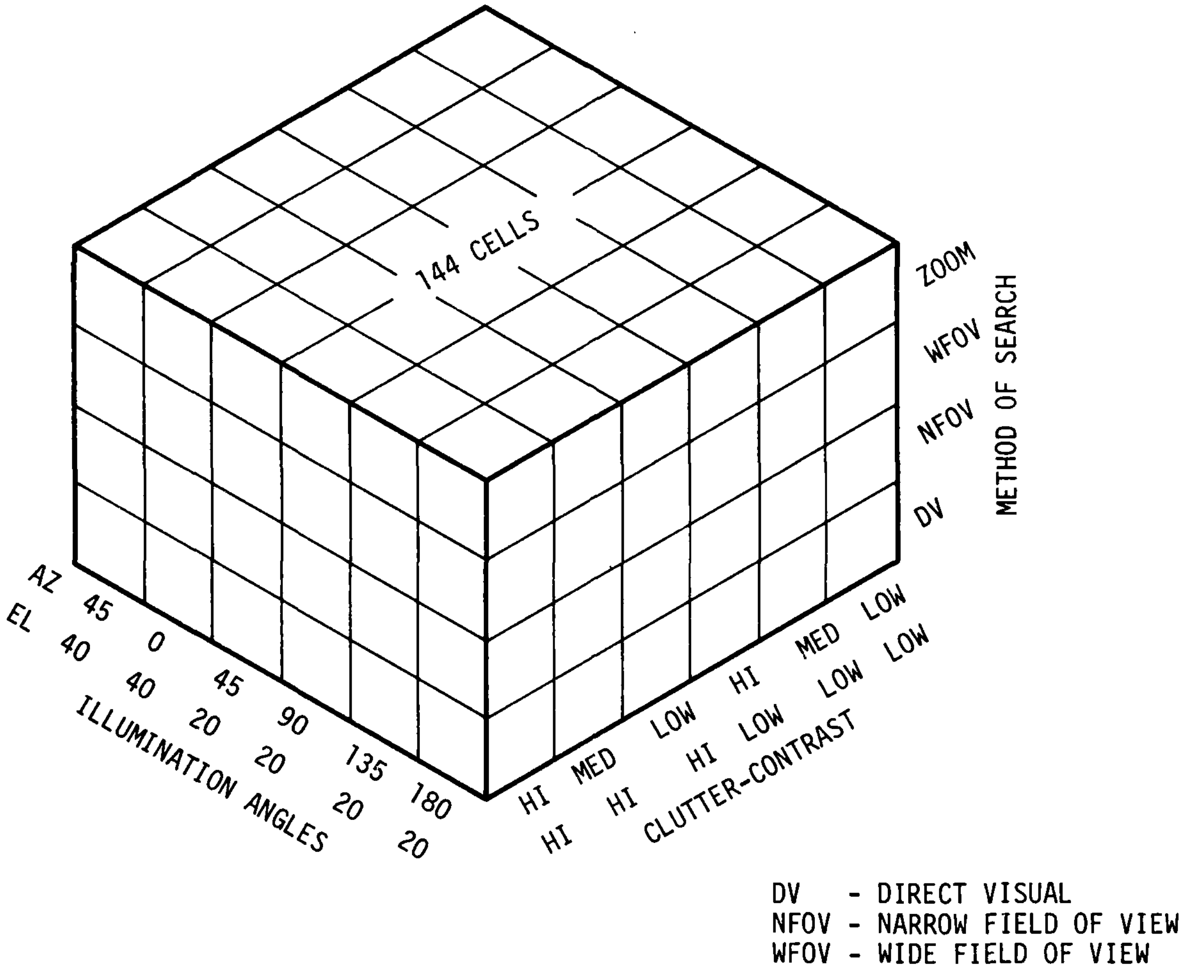
4 Direct visual search in parallel with search using a television sensor using a variable FOV (zoom lens, 8 to 2 degrees)(VF).

Two Observers, one trained and one untrained, ran identical run sets, giving a total of 288 experimental runs. No knowledge was obtained as to whether either group was more homogeneous than the other.

(1 table configuration) x (4 search modes) x (6 clutter/contrast conditions) x (6 illumination conditions) x (2 Observers running identical runs) = 288 experimental runs.

4.3 Hypothesis

Prior to the experiments, the following hypothesis relative to sub-experiment 3 were postulated (reference Project Plan IB1 of October 1974, Annex K, Section 5).



FACTORS CONSIDERED
- METHOD OF SEARCH - 4 TYPES
- CLUTTER - 3 LEVELS
- CONTRAST - 2 LEVELS
- ILLUMINATION - 6 LEVELS

OBSERVERS REQUIRED
- 8 FOR EACH OF 6 SUN ANGLES

MEASURES OF EFFECTIVENESS
- RANGE AT ACQUISITION
- PERCENT OF TARGETS ACQUIRED
- NUMBER OF FALSE ACQUISITIONS

NUMBER OF TARGETS
- 3 PER AREA

NUMBER OF EXPERIMENTAL RUNS
- (144 CELLS) x (1 TABLE CONFIGURATION) x (2 OBSERVERS RUNNING IDENTICAL RUN-SETS) = 288 EXPERIMENTAL RUNS

Figure 4-1. Design of Sub-experiment 3

1. Clutter will affect target acquisition in the order of best acquisition to worst as low, medium, and high

2. High contrast will product better target acquisition than low contrast

3. Clutter will interact with contrast such that medium and high clutter conditions will differentially degrade target acquisition; at equivalent levels of contrast target acquisition will be lower with clutter

4. Effects of shadow will act to increase the effects of clutter; at low clutter condition shadow will aid target acquisition; at high clutter conditions shadow will reduce target acquisition performance

5. Sun angle will improve target acquisition when it causes shadow to increase the lateral size of the target; target acquisition performance will be better at 90 degrees sun angle than at 0 or 180 degrees; 45 and 135 degrees sun angles will be better than 0 or 180 degrees but less than 90 degrees.

4.4 Method of Accomplishment

4.4.1 General Description

Each of the four search methods was used by different Observers against targets positioned on the terrain table.

The habitat was brought to the simulated altitude (3000 ft) and fixed in position. The run was started by the Experimenter at which time the curtain was raised and the terrain, starting at a slant range of 13 km, moved under the cockpit to simulate a flight velocity of approximately 400 knots. Each Observer made six separate runs. Each run posed a different situation of clutter/contrast and illumination. The Experimenter monitored the Observer's search on the TV monitor at his station.

In sub-experiment 3 there were 288 runs (48 each at El 20 degrees, Az 180 degrees; El 20, Az 135; El 20, Az 90; El 20, Az 45; El 40, Az 45; and El 40, Az 0) in which the sun simulator was attached to the terrain table and was repositioned as required to provide the proper illumination conditions for each target zone.

For the El 20, Az 180, and El 20, Az 135, the sun simulator was positioned at two different places. Since repositioning the sun simulator consumed a considerable amount of time, personnel batching was used. The Observers were all run through runs 1 - 2 - 3 on the west side of the terrain, then the sun simulator was repositioned and they were run through runs 4 - 5 - 6 on the east side of the terrain.

For the El 20, Az 90, the sun simulator was positioned at four different places. First runs 1 and 2 were made. Then the sun simulator was repositioned. Run 3 was made, then the sun simulator was repositioned. Runs 4 and 5 were made, then the sun simulator was repositioned one last time for run 6.

In the other runs of sub-experiment 3, the sun simulator was mounted in a fixed position while the terrain table moved through the light beam. For the 45 degree azimuth runs (20 degrees and 40 degrees elevation), the Observers were batched so that four of them were taken through zones I, II, and III with the sun simulator positioned on the west side of the terrain table. The sun simulator was then repositioned to the east side of the table and the batch was taken through zones IV, V, and VI. For the 0 degree azimuth, 40 degrees elevation, the Observers ran all six targets as in the overcast sky case of sub-experiment 1. Each run ended when the Observer signaled acquisition.

On the instant that the Observer signaled acquisition, a curtain came down in front of him and the sensor; the range and time of the acquisition were recorded. The terrain and habitat were repositioned for the next run. The run was stopped by the Experimenter when the Observer had overflown his target.

At the end of each of the Observer's six runs, the Experimenter asked the Observer questions about the target (location, number, color, and direction) to verify valid acquisition. This information was recored on the Experimenter Check Sheet and also entered into the computer through the use of the keyboard. Then the next run began.

4.4.2 Observers

Observer selection for sub-experiment 3 consisted of:

24	Martin Marietta
12	Air Force
7	Navy
5	Marines
48	

These runs were made from 22 January 1975 to 28 January 1975. One Martin Marietta Observer completed only the first three runs, then left the premises during a time-out for a sun simulator change. He could not be recalled in time to continue without seriously impacting the schedule.

4.4.3 Terrain Table Layout

The experiment utilized one of the six terrain table configurations that were used in sub-experiment 1 and which was also used for sub-experiment 2 (Configuration F); therefore, all six combinations of clutter and contrast were used, one for each of the six target zones. These are shown in Table 4-I.

TABLE 4-I. COMPOSITION OF CONFIGURATION F

Target Zone	I	II	III	IV	V	VI
Clutter/Contrast	ML	HL	LH	MH	HH	LL

Clutter was classified as either low, medium, or high. The levels of clutter were defined in terms of the number of target-like objects in the immediate vicinity of the target -- low clutter was represented by no trees in a 200 meter radius circle about the target; medium by 20 trees; and high by 60 trees.

The contrast of the individual targets with respect to their backgrounds took two levels: a low-contrast case in which the targets were only slightly darker than the background; and a high-contrast case, in which targets were considerably darker than the background.

Two different colors were used for the tank targets: dark O.D. (high contrast) and beige (low contrast).

Contrast was defined as the difference between the luminance of the target and background divided by the luminance of the background, i.e., $C = (L_T - L_B)/L_B$. Table 4-II presents the average contrast of the three tanks with respect to the background in the six target zones.

TABLE 4-II. NEGATIVE CONTRAST RATIO OF THE TARGETS

Target Zone	I	II	III	IV	V	VI
Contrast Ratio	0.31	0.38	0.82	0.78	0.71	0.27

4.4.4 Illumination Conditions

Uniform lighting characteristics of overcast weather, as well as directional lighting characteristics of sunlight were simulated. Overcast weather was simulated using overhead fluorescent lighting. Clear sky weather was simulated using the sun simulator to provide the different angles of illumination. In addition, overhead fluorescent lighting was used to provide diffused light simulating skylight effect.

Sub-experiment 3 used six different illumination conditions as shown in Table 4-III.

TABLE 4-III. ILLUMINATION CONDITIONS

Elevation	40	40	20	20	20	20
Azimuth	45	0	45	90	135	180

4.4.5 Measures Used

For each individual run, the range and time of acquisition were recorded; valid as well as false acquisitions and failures to acquire targets were also recorded.

4.5 Results

Two working procedures were used in the analysis of the data for sub-experiment 3:

1. Any correct acquisition made at the proper location was considered valid, regardless of how many tanks were reported at that location. Thus, when an Observer reported one, two, three, or more tanks at a proper location this was recorded as a valid target acquisition. Only valid acquisitions were considered in the statistical computations.

2. All data reporting mean range and the standard deviations thereof are based on the number of acquisitions made, and do not include unsuccessful acquisition attempts.

4.5.1 Analysis of Variance (General Linear Model)

The two primary variables of interest for analysis of this experiment were method of search and illumination condition. The analysis was approached using terrain table configuration F data from sub-experiment 1 to complete the elevation - azimuth set. Data sources for the various conditions are as follows:

Elevation 20°, Azimuth 45°	- Sub-experiment 3 -	48 Runs
Elevation 20°, Azimuth 90°	- Sub-experiment 3 -	48 Runs
Elevation 20°, Azimuth 135°	- Sub-experiment 3 -	48 Runs
Elevation 20°, Azimuth 180°	- Sub-experiment 3 -	48 Runs
Elevation 40°, Azimuth 0°	- Sub-experiment 3 -	48 Runs
Elevation 40°, Azimuth 45°	- Sub-experiment 3 -	48 Runs
Elevation 40°, Azimuth 90°	- Sub-experiment 1 -	48 Runs
Elevation 40°, Azimuth 135°	- Sub-experiment 1 -	48 Runs
Elevation 40°, Azimuth 180°	- Sub-experiment 1 -	48 Runs
	Total	432 Runs

Sub-experiment 3 was analyzed using the GLM ANOVA in two ways. First, the combinations of elevation and azimuth were treated as 9 levels of one factor. The ANOVA for this approach is shown in Table 4-IV. Main effects and two-way interactions are included in the model. At the .05 level of

significance, only clutter and the interaction of illumination angle versus Observer skill are significant.

TABLE 4-IV. ANALYSIS OF VARIANCE ILLUMINATION ANGLE DIFFERENCE (COMBINED FACTORS OF ELEVATION AND AZIMUTH)

Source	Sum of Squares	Degrees of Freedom	Mean Square	F Ratio
Illumination Angle	36226913.35	8	4528364.16	1.49910
Assigned Search Method	19708394.55	3	6569464.85	2.17480
Observer	649135.97	1	649135.97	.21489
Clutter	23064095.11	2	11532047.55	3.81765*
Contrast	6370693.37	1	6370693.37	2.10900
Illumination Angle/Observer	52044449.45	8	6505556.18	2.15365*
Assigned Search Method/ Contrast	1669886.35	3	556628.78	.18427
Observer/Clutter	4826323.79	2	2413161.89	.79887
Observer/Contrast	9769665.73	1	9769665.73	3.23422
Clutter/Contrast	4304179.58	2	2152089.79	.71244
Observer/Assigned Search Method	9383910.31	3	3127970.10	1.03551
Assigned Search Method/ Clutter	18587985.41	6	3097997.56	1.02558
Error	344361636.01	114	3020716.00	

*Significant at the .05 level

Second, the experiment was analyzed by separating the factors of elevation and azimuth. In this analysis the 0 degree azimuth for the 40 degrees elevation is eliminated since there was no corresponding 0 degree azimuth, 20 degrees elevation. The ANOVA for this approach is shown in Table V. Main effects and two-way interactions are included in the model. At the .05 level of significance only the two-way interactions of azimuth versus Observer skill and Observer skill versus contrast are significant. Clutter was not significant in this analysis. However, if most of the two-way interactions are dropped from the model then clutter becomes a significant variable. This indicates a possible problem implementing the GLM program when a large quantity of data is missing. The other established primary objective for sub-experiment 3, method of search, was shown to be not significant by the ANOVA (Tables 4-IV and 4-V).

TABLE 4-V. ANALYSIS OF VARIANCE ILLUMINATION ANGLE DIFFERENCE (SEPARATE FACTORS OF ELEVATION AND AZIMUTH)

Source	Sum of Squares	Degrees of Freedom	Mean Square	F Ratio
Sun Elevation	6664537.47	1	6664537.47	2.31748
Sun Azimuth	10093089.74	3	3365363.24	1.16990
Assigned Search Method	13441949.35	3	4480649.78	1.55807
Observer	1237118.49	1	1237118.49	0.43019
Clutter	8910933.25	2	4455466.62	1.54931
Contrast	636439.35	1	636439.35	0.22131
Elevation/Observer	6391171.33	1	6391171.33	2.22242
Elevation/Assigned Search Method	22866524.68	3	7622174.89	2.65048
Elevation/Azimuth	9360873.88	3	3120291.29	1.08503
Elevation/Contrast	2868488.24	1	2868488.24	0.99747
Elevation/Clutter	2142507.53	2	1071253.76	0.37251
Azimuth/Assigned Search Method	49859293.61	9	5539921.51	1.92641
Azimuth/Observer	25365522.69	3	8455174.23	2.94014*
Azimuth/Clutter	20735511.83	6	3455918.63	1.20174
Azimuth/Contrast	7953674.81	3	2651224.93	0.92192
Observer/Assigned Search Method	11523430.18	3	3841143.39	1.33569
Assigned Search Method/ Clutter	12751839.88	6	2125306.64	0.73904
Assigned Search Method/ Contrast	18863986.16	3	6287995.38	2.18654
Observer/Clutter	7577649.13	2	3788824.56	1.31750
Observer/Contrast	11581689.94	1	11581689.94	4.02733*
Clutter/Contrast	5758201.23	2	2879100.61	1.00116
Error	198428270.73	69	2875771.00	

*Significant at the .05 level

4.5.2 Primary Objectives

4.5.2.1 Search Method

4.5.2.1.1 Assigned Search Method

Table 4-VI shows the results for the assigned search methods. As in sub-experiments 1 and 2 there is no significant difference in assigned search methods either in acquisition range or number of acquisitions.

TABLE 4-VI. ASSIGNED SEARCH METHOD

Method	Mean Range ($\bar{x}$)	Standard Deviation ($\hat{\sigma}$)	Sample Size (N)
DV	5820m	1923	44
DV + WF	5153m	1738	47
DV + NF	5571m	1848	33
DV + VF	4970m	1906	31

Chi-square (χ^2 = 7.60 DF = 3) Not significant

4.5.2.1.2 Actual Search Method

Table 4-VII shows the results of the actual search method. As in previous experiments there was a tendency to use the direct visual mode. However, in this experiment there is no significant difference in the actual search modes in the mean range of acquisition.

TABLE 4-VII. ACTUAL SEARCH METHOD

Method	Mean Range ($\bar{x}$)	Standard Deviation ($\hat{\sigma}$)	Sample Size (N)	Misses
DV	5521m	1863	78	120
DV + WF	5429m	1797	30	39
DV + NF	5282m	1855	23	57
DV + VF	5049m	2006	24	61

Chi-square (χ^2 = 6.72 DF = 3) Not significant

4.5.2.2 Illumination

A major objective of this study was to examine the effects of varying sun angle and elevation. When data from sub-experiment 1 is combined with the data from sub-experiment 3, conditions of 40 and 20 degrees sun elevation can be considered at sun azimuths of 45, 90, 135, and 180 degrees. In addition, 40 degrees sun elevation at 0 degree azimuth was tested. (The physical setup of the Optical Laboratory did not allow the 20 degrees elevation, 0 degree azimuth case.) The results from sub-experiment 3 and table configuration F of sub-experiment 1 are shown in Table 4-VIII. The Chi-square test was significant for number of acquisitions, with a reduction of number of acquisitions as the azimuth was increased.

TABLE 4-VIII. EFFECT OF SUN ELEVATION AND AZIMUTH ON TARGET ACQUISITION

	20° Sun Elevation			40° Sun Elevation		
Sun Azimuth*	Mean Range ($\bar{x}$)	Standard Deviation ($\hat{\sigma}$)	Number Acquisitions	Mean Range ($\bar{x}$)	Standard Deviation ($\hat{\sigma}$)	Number Acquisitions
0°	(Not conducted)			5669m	1119	26
45°	5830m	1796	24	5624m	1379	22
90°	4299m	1878	15	4948m	1677	18
135°	6048m	2545	12	5163m	1916	14
180°	4976m	2412	10	5500m	2516	14

Chi-square (χ^2 = 22.78, DF = 8) Significant

The ANOVA (Tables 4-IV and 4-V) found no significant difference in acquisition range for elevation or azimuth effects. This is also evident from inspection of Table 4-IX and 4-X. The chi-square test for number of targets acquired was not significant for elevation. The ANOVA for sub-experiment 3 indicated that the interaction of illumination angle with Observer skill was significant (Table 4-IV). Thus, a two-way ANOVA (Table 4-XI) was conducted to test this possible interaction using the actual obtained valued. Combining data from sub-experiments 1 and 3, the results are not significant at the .05 level.

TABLE 4-IX. EFFECT OF SUN ELEVATION ON TARGET ACQUISITION (NOT SIGNIFICANT F(1,69) = 2.32)

Elevation	Mean Range ($\bar{x}$)	Standard Deviation ($\hat{\sigma}$)	Sample Size (N)
20°	5356m	2147	61
40°	5420m	1662	94

Chi-square (χ^2 = 2.23, DF = 1) Not Significant

TABLE 4-X. EFFECT OF SUN AZIMUTH ON TARGET ACQUISITION

Sun Azimuth (40° and 20°)	Mean Range ($\bar{x}$)	Standard Deviation ($\hat{\sigma}$)	Number Acquisitions
0	5669m	1119	26* Not included in GLM or χ^2
45	5731m	1596	46
90	4653m	1773	33
135	5571m	2227	26
180	5281m	2438	24

Chi-square (χ^2 = 13.86, DF = 3) Significant

TABLE 4-XI. OBSERVER VERSUS ILLUMINATION ANGLE (COMBINED DATA FROM SUB-EXPERIMENTS 1 AND 3)

Source	Sum of Squares	Degrees of Freedom	Mean Square	F Ratio
Observer	52328.19	1	52328.19	0.02
Illumination Angle	25982927.34	8	3247865.91	0.98
Observer/Illumination Angle	50544153.61	8	6318019.20	1.91
Error	452410991.65	137	3302270.01	

4.5.2.2.1 Sun Azimuth

Effects of sun azimuth are mixed. An overall F-test of the data indicates no statistically significant differences. When condition by condition comparisons are made, however, the data fall into separate groups. The 0, 45, and 135 degrees azimuths give longer acquisition ranges than the 90 and 180 degrees conditions, and approach significance. Table 4-X (which combines data from sub-experiment 3 and table configuration F only from sub-experiment 1) shows the distribution of sun azimuth. A chi-square test applied to number of acquisitions showed a significant difference in that more targets were acquired at 45 and 90 degrees azimuths. The ANOVA in Table 4-V indicated an interaction between azimuth and Observers. This interaction was not found to be significant when a two-way ANOVA was performed (Table 4-XII), possibly due to the implementation of the GLM when a

significant amount of data is missing. Due to the low F value, 1.01, found in Table 4-XII, however, the observed lack of significance is probably valid.

TABLE 4-XII. OBSERVER VERSUS AZIMUTH
(*SUB-EXPERIMENT* 3)

Source	Sum of Squares	Degrees of Freedom	Mean Square	F Ratio
Observer	117777.72	1	117777.72	0.03
Azimuth	11503433.01	3	3834477.67	1.01
Observer/ Azimuth	11482914.37	3	3827638.12	1.01
Error	458302725.54	121	3783625.83	

4.5.3 Secondary Objectives

4.5.3.1 Clutter

Clutter was found to be a significant factor in the main effects ANOVA (Table 4-IV), and not in the two-way ANOVA (Table 4-V). However, as variables were dropped from the model, clutter did become significant. Clutter is significant in both acquisition range and number of acquisitions. For acquisition ranges there did not appear to be any significant difference between levels of clutter when the 40 degrees elevation 0 degree azimuth data is excluded. Clutter followed the expected pattern, i.e., the acquisition range and number of acquisitions decreased as the level of clutter increased. These data are shown in Table 4-XIII and 4-XIV.

TABLE 4-XIII. EFFECT OF CLUTTER ON
TARGET ACQUISITION

Level	Mean Range ($\bar{x}$)	Standard Deviation ($\hat{\sigma}$)	Sample Size (N)
Low	5622m	1885	80
Medium	5340m	1859	41
High	4925m	1766	34

Chi-square (χ^2 = 45,59, DF = 2) Significant

TABLE 4-XIV. EFFECT OF CLUTTER (WITHOUT DATA FROM 40 DEGREES ELEVATION, 0 DEGREE AZIMUTH CASE)

Level	Mean Range ($\bar{x}$)	Standard Deviation ($\hat{\sigma}$)	Sample Size (N)
Low	5604m	1985	69
Medium	5262m	2019	32
High	4775m	1842	28

Chi-square (χ^2 = 35.79, DF = 2) Significant

4.5.3.2 Contrast

The effects of contrast are shown in Table 4-XV; no significant difference is noted in the mean range to acquisition due to contrast. The chi-square test, however, did show an inverse difference, with more targets being acquired at the low level.

TABLE 4-XV. EFFECTS OF CLUTTER

Level	Mean Range ($\bar{x}$)	Standard Deviation ($\hat{\sigma}$)	Sample Size (N)
Low	5548	1673	96
High	5146	2126	59

Chi-square (χ^2 = 13.0, DF = 1) Significant

There is an interaction between Observers and contrast indicated by Table 4-V. This is discussed in Section 4.5.5. The effects of clutter/contrast are shown in Table 4-XVI. The ANOVA was conducted to compare sub-experiment 1, table configuration F, with sub-experiment 3; there is no significant difference in the clutter/contrast effects at the .05 level of significance. Thus, the data from table configuration F for sub-experiments 1 and 3 are combined for further analysis.

TABLE 4-XVI. EFFECTS OF CLUTTER/CONTRAST

Clutter/Contrast	Table Configuration F Sub-Experiment 3	Table Configuration F Sub-Experiment 1*	Table Configuration F 1 and 3
LL Range	5682	5764	5705
Standard Deviation	1616	1837	1657
Number of Acquisitions	28	11	39
ML Range	5838	4920	5654
Standard Deviation	1675	1833	1721
Number of Acquisitions	28	7	35
HL Range	5690	2442	5100
Standard Deviation	1061	622	1618
Number of Acquisitions	18	4	22
LH Range	5495	5620	5544
Standard Deviation	2061	2216	2096
Number of Acquisitions	25	16	41
MH Range	2766	4991	3508
Standard Deviation	852	2304	1678
Number of Acquisitions	4	2	6
HH Range	4068	5141	4605
Standard Deviation	2596	1334	2047
Number of Acquisitions	6	6	12

*Includes sun angle data only

4.5.4 Additional Results

Trained Observers made 90 correct acquisitions; untrained made 65. Mean overall range of acquisition for trained Observers was 5430 with a standard deviation of 1898 meters; for all untrained Observers the mean range was 5347 with a standard deviation of 1824 as shown in Table 4-XVII. Untrained Observers exceeded the trained Observers except at the 45 degree azimuth wherein the trained Observers detected them at the longest range. For both groups, the worst azimuth was 90 degrees. The results are shown in Table 4-XVIII. Contrast influenced the untrained Observer's ability to detect the targets; the high level of contrast produced shorter detection ranges. The effect of contrast on the trained Observer performance is not significant, as seen in Table 4-XIX. As shown in Table 4-XX, for the combined factors of elevation and azimuth, trained Observers were definitely better at 20/45, 20/180, 40/45 and 40/135 degrees. Untrained Observers were considerably better at 20/135, 40/90 and 40/180 degrees. There is no significant difference between Observers at 20/90, and 40/0 degrees. Data are not available regarding differences between individuals or groups within either particular group of Observers.

TABLE 4-XVII. OBSERVER RESULTS

Observer	Mean Range ($\bar{x}$)	Standard Deviation ($\hat{\sigma}$)	Sample Size (N)
Untrained	5347m	1824	65
Trained	5430m	1898	90

Chi-square (χ^2 = 5.8, DF = 1) Significant

TABLE 4-XVIII. OBSERVER INTERACTION WITH AZIMUTH

Azimuth	Untrained	Trained
45°	5179m	6194m
90°	5062m	4499m
135°	5292m	5131m
180°	5580m	5029m

TABLE 4-XIX. OBSERVERS VERSUS CONTRAST

Source	Sum of Squares	Degrees of Freedom	Mean Square	F Ratio
Observer	305.02	1	305.02	0.00
Contrast	6096103.41	1	6096103.41	1.59
Observer/Contrast	13176982.12	1	13176982.12	3.43*
Error	479975879.33	125	3839807.03	

*Significant at .05 level

TABLE 4-XX. OBSERVER INTERACTION WITH ILLUMINATION ANGLE

Elevation/Azimuth		Untrained	Trained
20°	45°	5188m	6288m
	90°	4340m	4271m
	135°	5702m	4865m
	180°	3859m	5720m
40°	0°	5612m	5747m
	45°	5172m	6075m
	90°	6507m	4636m
	135°	4779m	5317m
	180°	6564m	4436m

4.6 Conclusions

4.6.1 Primary Objectives

1 In the ANOVA for sub-experiment 3 (Tables 4-IV and 4-V) the assigned method of search was not significant. There were six interactions tested:

Combined Elevation and Azimuth

a Assigned search method versus clutter

b Assigned search method versus contrast

c Assigned search method versus Observer

Separate Elevation and Azimuth

d Assigned search method versus elevation

e Assigned search method versus azimuth

f Assigned search method versus Observer

In the six interactions tested the assigned search method did not develop a significant F ratio. Therefore, it is concluded that the assigned search method did not affect the acquisitions. In the case of the actual search method

utilized, there was a considerable difference in the number of acquisitions made, with the direct visual (DV) method producing many more. In this sub-experiment, as in some of the others, the option given regarding the use of the sensor-aids in the WF, NF and VF runs was by-passed by the Observer in many runs, thereby influencing the number of acquisitions for each of the search methods used. Tables 4-VI and 4-VII are the basis for such conclusions.

2 Illumination Angle - The effects of varying sun angle (azimuth/elevation) were established as a major objective of this sub-experiment and nine different illumination angles (listed in Paragraph 4.5.1) were utilized to determine their influence on target acquisition. As a main effect, neither of these factors produced a significant F-number in the ANOVA computations for sub-experiment 3 (Tables 4-IV and 4-V). However, significance of azimuth was shown in the chi-square test. The 45 degrees azimuth produced the greatest number of acquisitions as well as the longest range at acquisition, as shown in Table 4-X; the other azimuths and elevations tested were not markedly different from each other, although the number of acquisitions for 40 degrees elevation produced a somewhat higher number of acquisitions than 20 degrees. An interaction was noted between illumination angle and Observer in Table 4-IV and another interaction between azimuth and Observer was displayed in Table 4-V. A two-way ANOVA conducted for the possible interaction of illumination angle and Observer (Table 4-XI) did not produce a significant F ratio. Paragraph 4.5.2,2 contains a rather detailed discussion of the various considerations of the illumination angle test results, particularly with regard to the mixing of azimuth effects. It is concluded that only minor influence on target acquisition was experienced under the test conditions established for sub-experiment 3.

4.6.2 Secondary Objectives

1 Throughout the test runs for sub-experiment 3, clutter exerted a significant influence on target acquisition in several different fashions. As a main effect (Table 4-IV) clutter influenced the range at acquisition and the number of acquisitions as shown in Tables 4-XIII and 4-XIV where clutter was analyzed both with and without the 40 degrees elevation and 0 azimuth. The expected pattern was followed showing that low clutter would have the least effect, medium clutter the next stronger, and high clutter would have the strongest influence. This secondary objective has been determined positive.

2 Contrast - The other secondary objective of this sub-experiment, contrast, did not show a significant F ratio in the ANOVA displayed in Tables 4-IV and 4-V. However, the chi-square test showed significance (Table 4-XV) with the number of acquisitions being considerably higher with high contrast between target and background. The interaction between contrast and Observer, first noted in Table 4-V, was investigated further with a two-way ANOVA which produced a significant F-number (Table 4-XIX). This effect was more notable with the untrained Observers than with the trained. For the established parameters used in sub-experiment 3, the data pertaining to contrast effects is inconclusive.

4.6.3 Hypothesis Correlations

1 Clutter - This hypothesis was supported as discussed in Paragraph 4.6.2,1, above.

2 Contrast - This hypothesis was not supported by sub-experiment 3, as discussed in Paragraph 4.6.2,2, above.

3 Clutter/Contrast - The first portion of this hypothesis was partially supported in that clutter interacted with contrast such that medium and high clutter conditions differentially degraded target acquisition. However, this was not to a large degree. The second part of the hypothesis is not supported under the conditions established for this sub-experiment. Under the conditions of high contrast, range at acquisition was greater with high clutter than with medium, but less than with low. This was evidenced in sub-experiment 3, sub-experiment 1 (Table Configuration F only), and also when these two tests were combined as shown in Table 4-XVI. Under low contrast conditions, there was no significant difference in range at acquisition in sub-experiment 3 although significance was developed in sub-experiment 1 with the Table F configuration.

4 Illumination Angle - Effects of shadow will aid acquisition at low clutter, but will hinder acquisition with high clutter.

Since illumination angle was a primary objective of this sub-experiment, a discussion of the effects of shadow is contained in Paragraph 4.6.2,2, above. No significant interaction was noted between illumination angle and clutter in the ANOVA (Tables 4-IV and 4-V). However, two chi-square tests were calculated to evaluate clutter both with and without the 40 degree elevation and 0 degree azimuth. In both cases the chi-square test proved significant as

shown in Tables 4-XIII and 4-XIV. In as much as the results are similar in both tests (i.e., acquisition range and number of acquisitions decreased as clutter was increased) it would appear that this hypothesis was not supported. Also, this hypothesis was not supported by the information discussed in Paragraph 4.6.1,2, above.

4.6.4 Additional Conclusions

In this sub-experiment, the trained Observers were significantly better at target acquisition than the untrained Observers, in the number of acquisitions. In both Tables 4-IV and 4-V, a significant F-number was noted for the interaction of Observer with illumination angle, Observer with azimuth, and Observer with contrast; therefore, these three interactions were analzyed further. The latter of these is discussed in Paragraph 4.6.2,2, above. The comparisons of Observers with azimuth alone or with a combination of elevation/azimuth showed a mixing of results to the effect that untrained Observers obtained approximately the same results as the trained. Sub-experiment 3 showed only minor improvement by the use of trained Observers over untrained as to range of acquisition, but the trained Observers displayed a definite advantage in number of acquisitions. Differences in the homogeneity of the groups could have been a partial cause of these mixed results; however, the data needed to evaluate this factor are not available.

5.0 SUB-EXPERIMENT 4

5.1 Objectives

As stated in the IB1 Project Plan the primary objectives of sub-experiment 4 were to determine target acquisition performance for rotary-wing profile as a function of:

1. Method of search

2. Target area clutter

3. Target-to-background contrast

4. Pop-up range to target.

The secondary objective was determination of target acquisition performance as a function of pop-up altitude.

5.2 Experimental Design

The experiment examined in detail the performance of three search methods under four different conditions of varying clutter/contrast combinations and nine different altitude/range combinations. The three search methods were:

1. Direct visual search without search aids

2. Direct visual search in parallel with search using a television sensor using a variable FOV (8 degrees to 2 degrees zoom) (VF)

3. Direct visual search in parallel with search using a simulated 8 power stabilized magnifying optical device.

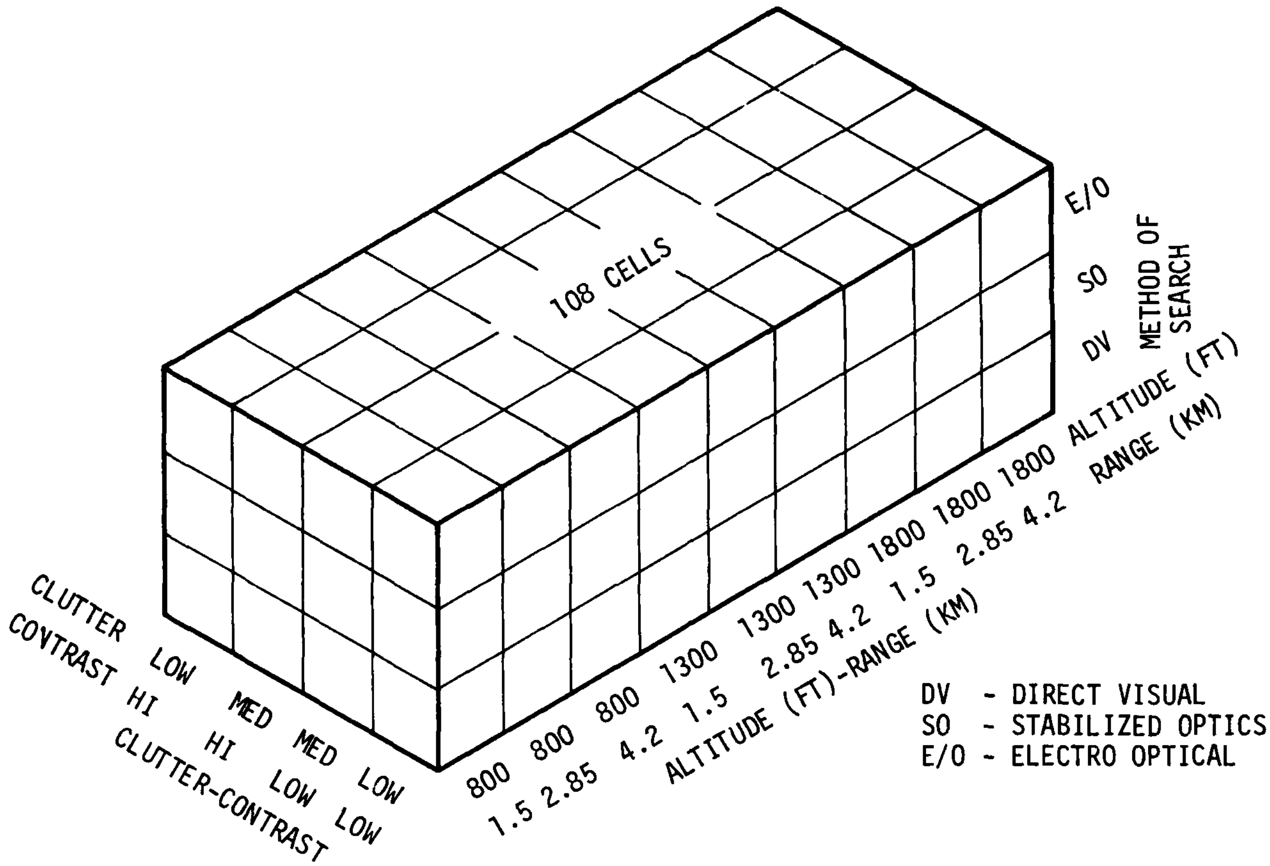
Two Observers, one trained and one untrained, ran identical run sets, giving a total of 864 experimental runs. Additional considerations, such as inter-subject variability within each group of subjects, were not addressed in this study.

(4 table configurations) x (3 search modes) x (4 clutter/contrast conditions) x (9 range/altitude combinations) x (2 Observers running identical runs) = 864 experimental runs.

Figure 5-1 diagrams the design of this experiment.

5.3 Hypotheses

Prior to the experiments, the following hypotheses relative to sub-experiment 4 were postulated (reference Project Plan IB1 of October 1974, Annex K, Section 5).



FACTORS CONSIDERED
- METHOD OF SEARCH - 3 TYPES
- CLUTTER - 2 LEVELS
- CONTRAST - 2 LEVELS
- POP-UP RANGE - 3 LEVELS
- POP-UP ALTITUDE - 3 LEVELS

OBSERVERS REQUIRED
- 54 FOR EACH OF 4 CONFIGURATIONS OF TERRAIN TABLE

MEASURES OF EFFECTIVENESS
- MEAN TIME TO ACQUISITION
- PERCENT OF TARGETS ACQUIRED
- NUMBER OF FALSE ACQUISITIONS

NUMBER OF TARGETS
- 3 PER AREA

NUMBER OF EXPERIMENTAL RUNS
- (108 CELLS) x (4 TABLE CONFIGURATIONS) x (2 OBSERVERS RUNNING IDENTICAL RUN-SETS) = 864 EXPERIMENTAL RUNS

Figure 5-1. Design of Sub-experiment 4

1 Clutter will affect target acquisition in the order of best acquisition to worst as low, medium, and high

2 High contrast will produce better target acquisition than low contrast

3 Clutter will interact with contrast such that medium and high clutter conditions will differentially degrade target acquisition; at equivalent levels of contrast target acquisition will be lower with clutter.

5.4 Method of Accomplishment

5.4.1 General Description

Each of the three search methods was used by different Observers against targets positioned on the terrain table.

The habitat was brought to the simulated altitude (800 ft, 1300 ft, or 1800 ft) and fixed in position. The run was started by the Experimenter at which time the curtain was raised and the terrain remained at a fixed range (1500m, 2850m, or 4200m). The Observer searched until he found the targets or for a maximum of one minute.[1] Each Observer made four separate runs.

Each run posed a different situation of clutter/contrast while the illumination was maintained constant. Four different zones of the terrain table and four levels of clutter/contrast were used. Four table setups were prepared so that each target zone received each of the combinations of clutter and contrast.

The reason for the choice of four levels of clutter/contrast, rather than the six levels used in sub-experiment 1, was to present a balanced set of stimuli to the Observers. The two levels of clutter/contrast which were omitted were determined from the results of sub-experiment 1, i.e., high clutter, high contrast; and high clutter, low contrast.[2]

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[1] It is recognized that in a tactical situation aircraft survival would ordinarily dictate a much shorter search time in the pop-up mode. To satisfy experimental objectives, however, a relatively long search time was required to assure that detection probability did not become time-truncated. The one-minute figure was determined based on similarity with the available search time in the fixed wing experiment (57 to 63 seconds) and the probability that most acquisitions would occur in 30 seconds or less.

[2] Initially, high clutter, low contrast and low clutter, high contrast were selected for omission, since these were the expected "outliers," i.e., lowest acquisition rate and highest acquisition rate. Subsequent analysis of the results of sub-experiment 1, however, revealed that this was not the case.

The Observers searched each configuration of the terrain table, using all combinations of pop-up range, pop-up altitude, and search method. On the instant that the Observer signaled acquisition, a curtain came down in front of him and the elapsed time for the acquisition was recorded. The terrain and habitat were repositioned for the next run. The run was stopped by the Analog Computer Operator after one minute if the Observer failed to acquire the targets.

At the end of each of the four runs, the Experimenter asked the Observer questions about the target (location, number, color, and direction) to verify correct acquisition. This information was recorded on the Experimenter Check Sheet and also entered into the computer through the use of the keyboard. Then the next run began.

5.4.2 Observers

Observer selection for sub-experiment 4 consisted of:

117	Martin Marietta
64	Army
35	Navy
216	

The runs were made from 10 February 1975 to 26 February 1975. Martin Marietta supplied substitutes for nine experienced Observers who failed to arrive on schedule. These substitutes were experienced pilots or air crewmen with recent helicopter flight time.

5.4.3 Terrain Table Layout

Sub-experiment 4 used terrain table configurations G, H, I, and J. Each configuration was divided into four separate target zones. Each zone represented a different combination of clutter/contrast; these combinations were rotated as shown in Table 5-I.

TABLE 5-I. CLUTTER/CONTRAST COMPOSITION OF CONFIGURATIONS G THROUGH J

Target Zone	G	H	I	J
I	LL	ML	LH	MH
II	ML	LH	MH	LL
III	LH	MH	LL	ML
IV	MH	LL	ML	LH

Clutter was classified as either low, medium, or high. The levels of clutter were defined in terms of the number of target-like objects in the immediate vicinity of the target -- low clutter was represented by no trees in a 200 meter radius circle about the target; medium by 20 trees; and high by 60 trees.

The contrast of the individual targets with respect to their backgrounds took two levels: a low-contrast case in which the targets were only slightly darker than the background; and a high-contrast case, in which targets were considerably darker than the background.

Two different colors were used for the tank targets: dark O.D. (high contrast) and beige (low contrast).

The different contrast levels were achieved by varying the luminance of both the targets and the backgrounds. Contrast was defined as the difference between the luminance of the target and background divided by the luminance of the background, i.e., $C = (L_T - L_B)/L_B$. Table 5-II presents the average contrast of the three target tanks in each zone with respect to the background for each configuration.

TABLE 5-II. NEGATIVE CONTRAST RATIO OF THE TARGETS IN THE DIFFERENT TARGET ZONES FOR CONFIGURATIONS G THROUGH J

Target Zone	G	H	I	J
I	0.20	0.32	0.65	0.61
II	0.28	0.64	0.67	0.31
III	0.66	0.71	0.30	0.36
IV	0.67	0.28	0.27	0.65

5.4.4 Illumination Condition

Overcast condition was used for all runs in sub-experiment 4. Overhead fluorescent lighting was used producing 500 foot-candles at the terrain table surface.

5.4.5 Measures Used

For each individual run, the time of acquisition was recorded; valid as well as false acquisitions and failures to acquire targets were also recorded.

5.5 Results

Two working procedures were used in the analysis of the data for sub-experiment 4:

1 Any correct acquisition made at the proper location was considered valid, regardless of how many tanks were reported at that location. Thus, when an Observer reported one, two, three, or more tanks at a proper location this was recorded as a valid target acquisition. Only valid acquisitions were considered in the statistical computations.

2 All data reporting mean or median ranges (median ranges are employed since sharply skewed distributions are more representable by median values than mean values) and standard deviations thereof are based upon the number of acquisitions made, and do not include unsuccessful acquisition attempts.

The dominant factors in this first of two helicopter experiments were table configuration, method of search, helicopter altitude, range, Observer skill, clutter, and contrast. In this experiment, the observed response was detection time in seconds; range was fixed. Since the distribution of time was highly skewed, a logarithmic transformation was applied to data before the ANOVA was conducted (see Appendix D). The percentage of acquisition in this sub-experiment was significantly higher (90 percent) than in sub-experiments 1, 2, and 3 (40 percent). Out of 864 trials, 781 acquisitions were recorded.

5.5.1 Analysis of Variance (General Linear Model)

Table 5-III shows the ANOVA for sub-experiment 4. All main effects and two-way interactions were included in the model. At the .05 level of significance all the main effects except altitude were significant. Five two-way interactions (table versus range, table versus contrast, method of search versus range, range versus clutter, and clutter versus contrast) were significant at the .05 level.

TABLE 5-III. ANOVA

Source	Sum of Squares	Degrees of Freedom	Mean Square	F Ratio
Table	1.60387	3	.54362	7.55512*
Assigned Search Method	2.60387	2	1.36071	19.22911*
Altitude	0.21298	2	.10649	1.50490
Range	15.22001	2	7.61000	107.54233*
Observer	1.66511	1	1.66511	23.53085*

TABLE 5-III. ANOVA (Cont)

Source	Sum of Squares	Degrees of Freedom	Mean Square	F Ratio
Clutter	7.04735	1	7.04735	99.59105*
Contrast	1.86038	1	1.86038	26.29034*
Table/Assigned Search Method	0.61881	6	0.10314	1.45748
Table/Altitude	0.31562	6	0.05260	0.74337
Table/Range	1.17627	6	0.19604	2.77045*
Table/Observer	0.17232	3	0.05744	0.81173
Table/Clutter	0.45225	3	0.15075	2.13035
Table/Contrast	1.53146	3	0.51049	7.21406*
Assigned Search Method/ Altitude	0.24707	4	0.06177	0.87290
Assigned Search Method/Range	1.93074	4	0.48269	6.82118*
Assigned Search Method/ Observer	0.10981	2	0.05491	0.77591
Assigned Search Method/ Clutter	0.05466	2	0.02733	0.38622
Assigned Search Method/ Contrast	0.15363	2	0.07682	1.08554
Altitude/Range	0.38346	4	0.07586	1.87210
Altitude/Observer	0.08214	2	0.04107	0.58041
Altitude/Clutter	0.12836	2	0.06418	0.90700
Altitude/Contrast	0.08110	2	0.04055	0.57306
Range/Observer	0.13760	2	0.06880	0.57227
Range/Clutter	0.59498	2	0.29749	4.20404*
Range/Contrast	0.37087	2	0.18544	2.62052
Observer/Clutter	0.00564	1	0.00564	0.07969
Observer/Contrast	0.04835	1	0.04835	0.68329
Clutter/Contrast	3.14467	1	3.14467	44.43951*
ERROR	50.10014	708	0.07076	

*Significant at the .05 level

5.5.2 Primary Objectives

5.5.2.1 Assigned Search Methods

The assigned search method was found to be significant in the ANOVA using the GLM. The direct visual (DV) mode resulted in the shortest detection time and the electro-optical (E/O) television aid, the longest. The difference between the stabilized optics (SO) mode and the E/O mode was not significant. There was no significant difference in the number of acquisitions per assigned search method as indicated in the chi-square test. Table 5-IV shows the assigned search method results.

TABLE 5-IV. ASSIGNED SEARCH METHOD RESULTS (SIGNIFICANT DIFFERENCE $F(2,708) = 19.23$)

Assigned Search Method	Mean Time ($\bar{x}$)	Median (X.50)	Standard Deviation ($\hat{\sigma}$)	Sample Size (N)
DV	5.24s	2.50	7.91	261
DV + SO	6.35s	3.80	6.99	260
DV + EO	8.21s	3.50	10.61	260

Chi-square ($\chi^2 = 0.03$, DF = 2) Not significant

Also, there was an interaction between assigned search method and range. As the range increased the detection time also increased. The detection time for the DV mode increased slightly as the range increased; however, for the other modes the time increased significantly as the range increased. Table 5-V presents the log values for the various combinations of assigned search method and range. Table 5-VI shows the results of the ANOVA.

TABLE 5-V. EFFECT OF ASSIGNED SEARCH METHOD BY RANGE (IN LOG VALUES)

Assigned Search Method	Range 1500m	2850m	4200m
DV	0.52	0.70	0.71
DV + SO	0.59	0.75	1.01
DV + EO	0.54	0.79	0.87

TABLE 5-VI. ANOVA - ASSIGNED SEARCH METHOD VERSUS RANGE

Source	Sum of Squares	Degrees of Freedom	Mean Square	F Ratio
Assigned Search Method	2.73530	2	1.36765	14.98*
Range	13.01692	2	6.50846	71.27*
Assigned Search Method x Range	1.97281	4	0.49320	5.40*
Error	70.50258	772	0.09132	

*Significant at the .05 level

5.5.2.2 Actual Search Method

As in the fixed wing experiments, there was a tendency for the Observers to disregard the aid and go to the DV mode. In fact the percentage of targets acquired in this experiment using the DV mode was over double that for the fixed wing experiments. Approximately 90 percent of the acquisitions were made using the DV mode. The DV mode resulted in the shortest detection time and the E/O the longest. Experimenters report that at the 1500 meter range, even with clutter, there was little need to use a search aid. At the 2850 meter range, some Observers did use the aid. It was only at the 4200 meter range, especially at the 800 foot elevation, that the aid was used to any extent. Table 5-VII shows the ANOVA for the actual search method and Table 5-VIII shows the actual search method result.

TABLE 5-VII. ANOVA ACTUAL SEARCH METHOD

Source	Sum of Squares	Degrees of Freedom	Mean Square	F Ratio
Actual Method of Search	20896.94	2	10445.47	211.6*
Error	38407.41	778	49.36	

*Significant at the .05 level

TABLE 5-VIII. ACTUAL SEARCH METHOD RESULTS
(SIGNIFICANT DIFFERENCE
$F(2,780) = 211.6$)

Method	Mean Time ($\bar{x}$)	Median (X.50)	Standard Deviation ($\hat{\sigma}$)	Sample Size (N)
DV	4.49s	2.6	5.94	660
DV + SO	14.37s	10.9	9.10	64
DV + EO	22.29s	19.2	13.37	57

Chi-square ($\chi^2 = 81.15$, DF = 2) Significant

5.5.2.3 Clutter/Contrast

The effects of clutter and contrast as well as the interaction between the two factors were found to be significant.

The four conditions of clutter/contrast used were low/low (LL), medium/low (ML), low/high (LH) and medium/high (MH). Table 5-IX presents the mean data by clutter and contrast for each table.

TABLE 5-IX. CLUTTER/CONTRAST EFFECTS BY TABLE SETUP

Clutter/ Contrast	G			H			I			J			Total		
	Number	Median (X.50)	Mean Time ($\bar{x}$)	Number	Median (X.50)	Mean Time ($\bar{x}$)	Number	Median (X.50)	Mean Time ($\bar{x}$)	Number	Median (X.50)	Mean Time ($\bar{x}$)	Number	Median (X.50)	Mean Time ($\bar{x}$)
LL	54	2.8	4.99s	49	3.6	10.10s	53	1.9	2.62s	53	3.5	4.93s	209	2.7	5.57s
ML	52	2.7	4.70s	46	4.15	7.20s	47	3.1	7.98s	50	2.85	4.27s	195	3.2	5.97s
LH	52	1.9	4.64s	53	2.8	4.65s	53	2.4	4.44s	50	2.8	4.31s	208	2.5	4.51s
MH	46	4.75	9.63s	37	5.1	9.45s	48	5.35	9.8[illegible]	38	11.4	16.33s	169	6.4	11.15s

The conditions of low clutter and low contrast resulted in shorter detection times than did the medium clutter and high contrast conditions (see Tables 5-X and 5-XI).

TABLE 5-X. CLUTTER
(SIGNIFICANT DIFFERENCE F(1,704 = 99.59)

Level	Mean Time ($\bar{x}$)	Median (X.50)	Standard Deviation ($\hat{\sigma}$)	Sample Size (N)
Low	5.05s	2.50	7.04	416
Medium	8.35s	4.40	10.03	365

Chi-square (χ^2 = 33.32, DF = 2) Significant

TABLE 5-XI. CONTRAST
(SIGNIFICANT DIFFERENCE F(1,708) = 26.29)

Level	Mean Time ($\bar{x}$)	Median (X.50)	Standard Deviation ($\hat{\sigma}$)	Sample Size (N)
Low	5.75s	2.90	7.93	405
High	7.50s	3.50	9.43	376

Chi-square (χ^2 = 10.45, DF = 1) Significant

At the low condition of clutter the acquisition times for low and high contrast are not significant; at the high condition of clutter they are significant. The ANOVA for clutter and contrast is shown in Table 5-XII. Table 5-XIII shows the mean detection time for the four combinations of clutter and contrast.

TABLE 5-XII. CLUTTER VERSUS CONTRAST

Source	Sum of Squares	Degrees of Freedom	Mean Square	F. Ratio
Clutter	5.51236	1	5.51236	54.14*
Contrast	1.44721	1	1.44721	14.21*
Clutter x Contrast	2.68823	1	2.68823	26.40*
Error	79.10612	777	0.10181	

*Significant at the .05 level

TABLE 5-XIII. EFFECT OF CLUTTER ON CONTRAST

Clutter	Contrast	
	Low	High
Low	5.57	5.97
Medium	4.51	11.15

5.5.2.4 Additional Interactions

There was also an interaction between clutter and range and between contrast and table configuration. As the range increased, the change in effect of clutter became greater as shown in Table 5-XIV.

TABLE 5-XIV. EFFECT OF RANGE AND CLUTTER (IN LOG VALUES)

Range	Clutter	
	Low	Medium
1500M	0.50	0.61
2850M	0.65	0.86
4200M	0.78	0.98

The effects of clutter and contrast were not uniform between terrain table configurations as shown in Table 5-IX. The effects of contrast on table configuration was significant as seen in Table 5-XV.

TABLE 5-XV. TABLE CONFIGURATION VERSUS CONTRAST

Source	Sum of Square	Degrees of Freedom	Mean Square	F Ratio
Table	1.08100	3	0.36033	3.30*
Contrast	1.03026	1	1.03026	9.44*
Table x Contrast	1.83017	3	0.58006	9.13
Error	84.35666	773	0.10913	

*Significant at the .05 level

5.5.2.5 Range

Range was shown to be a significant factor in the ANOVA presented in Table 5-III. The effect of range followed the expected pattern: as range increased from 1500 to 4200 meters the detection time went up and the number of acquisitions decreased. These data are shown in Table 5-XVI.

TABLE 5-XVI. EFFECT OF POP-UP RANGE (SIGNIFICANT DIFFERENCE $F(2,708) = 107.54$)

Pop-Up Range	Mean Time ($\bar{x}$)	Median (X.50)	Standard Deviation ($\hat{\sigma}$)	Sample Size (N)
1500m	3.61s	2.00	5.40	274
2850m	6.97s	3.40	8.69	265
4200m	9.57s	5.80	10.54	242

Chi-square ($\chi^2 = 21.78$, DF = 2) Significant

There was an interaction between pop-up range and terrain table configurations and between pop-up range and clutter. The interaction between table configurations and range is discussed in Section 5.5.4. Table 5-XVII shows the ANOVA for range and clutter.

TABLE 5-XVII. RANGE VERSUS CLUTTER

Source	Sum of Squares	Degrees of Freedom	Mean Square	F Ratio
Pop-up Range	14.06947	2	7.03474	79.32*
Clutter	5.91833	1	5.91833	66.73*
Range x Clutter	0.37226	2	0.18613	2.10
Error	68.73081	775	0.08868	

*Significant at the .05 level

5.5.3 Secondary Objective

5.5.3.1 Altitude

Pop-up altitude was included in this experiment as a secondary objective. The ANOVA did not show altitude to be a significant factor, nor was the interaction of altitude with the other factors significant. The results for the three altitudes are shown in Table 5-XVIII.

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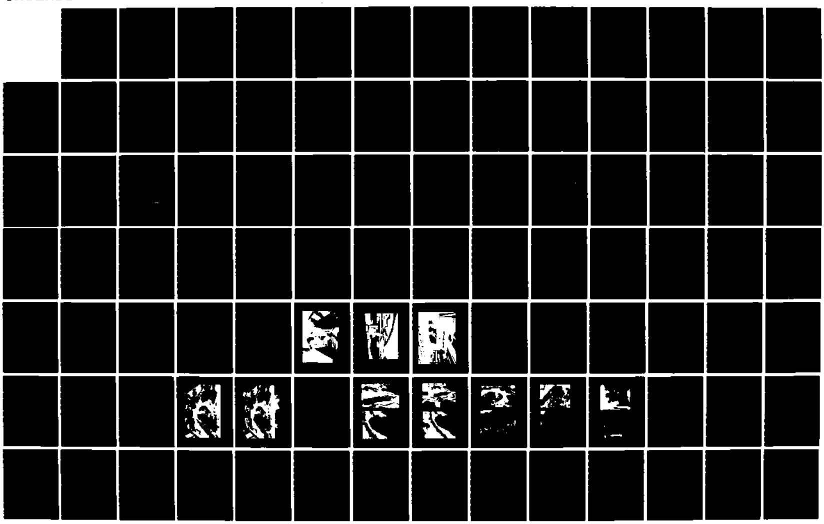

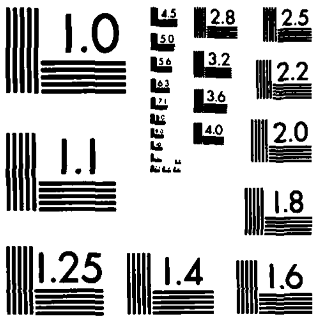
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1.8
1.25
1.4
1.6

TABLE 5-XVIII. ALTITUDE EFFECTS (NO SIGNIFICANT DIFFERENCE $F(2,708) = 1.50$)

Altitude	Mean Time ($\bar{x}$)	Median ($X_{.50}$)	Standard Deviation ($\hat{\sigma}$)	Sample Size (N)
1800 feet	6.84s	2.80	9.85	262
1300 feet	6.32s	3.20	8.34	263
800 feet	6.63s	3.35	7.84	256

Chi-square ($\chi^2 = 1.15$, DF = 2) Not significant

5.5.4 Additional Results

5.5.4.1 Observers

In contrast to the fixed wing experiments, Observer training was significant. The trained Observers tended to detect more targets and detect them more quickly than untrained Observers. Trained Observers made 410 correct acquisitions, untrained made 371. Mean time of acquisition was 5.83 seconds for trained, 7.45 seconds for untrained. The median times were 2.7 for trained and 3.8 for untrained. These data are shown in Table 5-XIX. The differences are also related to clutter and contrast as is seen in Table 5-XX. Trained Observers tend to find more hard (cluttered) targets and do it faster.

TABLE 5-XIX. OBSERVERS EFFECTS (SIGNIFICANT DIFFERENCE $F(1,708) = 23.53$)

Observer	Mean Time ($\bar{x}$)	Median ($X_{.50}$)	Standard Deviation ($\hat{\sigma}$)	Sample Size (N)
Untrained	7.45s	3.80	9.56	371
Trained	5.83s	2.70	7.82	410

Chi-square ($\chi^2 = 19.25$, DF = 1) Significant

TABLE 5-XX. CLUTTER/CONTRAST EFFECTS BY OBSERVER TYPE

Untrained			
Clutter/Contrast	Number	Median (X.50)	Mean Time ($\bar{X}$)
LL	104	3.1	6.02s
ML	90	4.0	6.74s
LH	101	2.9	5.45s
MH	76	7.7	12.89s
Trained			
Clutter/Contrast	Number	Median (X.50)	Mean Time ($\bar{X}$)
LL	105	2.30	5.13s
ML	105	2.8	5.31s
LH	107	2.30	3.63s
MH	93	5.40	9.73s

5.5.4.2 Terrain Table Configuration Effect

There was a significant difference among table configurations: terrain table configurations G and I differ significantly from configurations H and J. Configurations G and I are not significantly different from each other and H and J are not different from each other. These results are shown in Table 5-XXI.

TABLE 5-XXI. TERRAIN TABLE EFFECTS (SIGNIFICANT DIFFERENCE $F(3,705) = 7.56$)

Table	Mean Time ($\bar{X}$)	Median (X.50)	Standard Deviation ($\hat{\sigma}$)	Sample Size (N)
G	5.87s	2.80	8.17	204
H	7.69s	3.50	10.10	185
I	6.07s	2.60	8.54	201
J	6.86s	3.80	8.05	191

Chi-square ($\chi^2 = 12.41$, DF = 3) Significant

There is an interaction between terrain table configuration and pop-up range as shown in Table 5-XXII. Additional data is shown in Table 5-XXIII.

TABLE XXII. TABLE VERSUS POP-UP RANGE

Source	Sum of Squares	Degrees of Freedom	Mean Square	F Ratio
Table Configuration	1.24415	3	0.41472	4.41*
Range	13.16502	2	6.58251	70.01*
Table x Range	1.35854	6	0.22642	2.41*
Error	72.30213	769	0.09402	

*Significant at the .05 level

TABLE 5-XXIII. EFFECTS OF TERRAIN TABLES AND POP-UP RANGE (IN LOG VALUE)

Configuration	1500m	2850m	4200m
G	0.50	0.67	0.88
H	0.54	0.84	0.93
I	0.55	0.67	0.83
J	0.62	0.82	0.83

5.6 Conclusions

In sub-experiment 4, the amount of missing data is not as great as in the previous sub-experiments. Therefore, more emphasis can be placed on the results obtained from the analysis of variance. The missing data did cause the experiment to be analyzed as a completely crossed design instead of a partially nested design. This tends to make the analysis less sensitive (that is, less likely to find significant difference where they exist).

5.6.1 Primary Objectives

1 Method of Search

The method of search was a primary objective for the entire experiment IB1 of the SEEKVAL program; therefore, in sub-experiment 4 as well as in sub-experiment 5, when assigned to use one of the aids the Observers were given the option of using either direct visual (DV) method or using direct visual aided by either the SO method or EO method. Also, in the rotary wing experiments, time was the factor of measurement, rather than acquisition ranges used in the fixed wing experiments. The Observers selected the DV method to a much greater degree in sub-experiments 4 and 5 than in the first three sub-experiments. As noted in Table 5-VIII, the number of acquisitions achieved by DV was five times greater than those achieved by the other

two methods in actual search method; and it was twice as great as the number of acquisitions made in any of the three methods in the assigned search method. This occurrence was particularly evident at the 1500 meter range, indicating that the visual aids were of no real value in short-range target detection when the use is optional. In fact, it is shown statistically in both Tables 5-IV and 5-VIII that the acquisition time was increased when the visual aids were utilized. It is possible, of course, that these results could have changed if the nested design of the tests had been retained.

2 Pop-up Range

Pop-up range was a significant factor in this experiment, and probably was the most dominant factor considered in any of the five experiments under experiment IB1. Of all of the ANOVA's calculated, the pop-up range, where applicable, was consistently the largest contributor to statistical significance. As shown in Table 5-XVI, the ANOVA developed a very significant F ratio, the mean times for acquisition were lower for 1500 meters than for 2850 meters, and means for 2850 meters were lower than for 4200 meters range. Also the number of acquisitions increased as the pop-up range was shortened. Inasmuch as the three pop-up ranges assigned to this experiment were somewhat less than the overall mean range at acquisition for the fixed wing experiments, this strong influence of pop-up range on the data analysis could have been expected. The primary objective of sub-experiment 4 with regard to pop-up range has been positively achieved for the pop-up ranges of 1500, 2850, and 4200 meters.

3 Clutter

Another primary objective for this sub-experiment was the effect of clutter, which approached the level of influence exerted by pop-up range in dominance of analysis data. Both significantly lower mean times for acquisition and significantly more acquisitions were achieved under low clutter conditions than with high clutter. The analysis for interaction of pop-up range and clutter (Table 5-XIV) demonstrated that clutter had a greater effect on acquisition as the pop-up range was increased, indicating that clutter was only slightly less influential than pop-up range. The interaction of clutter and contrast analysis (Table 5-IX) showed clutter to have a greater effect than contrast and the two way ANOVA (Table 5-XII) produced a significant F ratio for the interaction, with clutter contributing the greater influence. In regard to the primary objective of the IB1 experiment, comparing direct visual acquisition with sensor-aided vision, the ANOVA showed the interaction of assigned search method versus clutter was not significant.

4 Contrast

Contrast of the targets with respect to the background was also a primary objective of sub-experiment 4, and the ANOVA (Table 5-III) showed a significant F ratio for contrast. However, Table 5-XI displays a shorter mean time for acquisition and a greater number of acquisitions for low contrast than for high contrast conditions. This inversion of results from the expected, as well as from results of previous target acquisition studies, would appear to indicate that some other variable influenced these acquisitions. To resolve this apparent anomaly, it would seem that either additional controls in the test environment or a more restrictive definition of contrast should be established in future testing.

5.6.2 Secondary Objective

1 Pop-up Altitude

A secondary objective of sub-experiment 4 was achieved in determining that pop-up altitude had no significant effect upon target acquisition for the conditions set forth in this test. As a main effect, pop-up altitude did not produce a significant F ratio (Table 5-III); mean acquisition times were nearly identical for the three altitudes of 800, 1300, and 1800 feet, and the number of acquisitions achieved for each were quite close. Six interactions of altitude with other variables (altitude versus assigned search method, altitude versus pop-up range, altitude versus Observer, altitude versus clutter, altitude versus table configuration, and altitude versus contrast) were also tested in the ANOVA (Table 5-III) and in none of these cases did the interaction prove to be significant.

5.6.3 Hypotheses Correlations

1 Clutter

As stated in Paragraph 5.6.1 3, clutter had a definite effect upon target acquisition in the order of best to worst acquisition as low, medium, and high clutter were utilized. The hypothesis was supported.

2 Contrast

High contrast will produce better target acquisition than low contrast. The results of sub-experiment 4 demonstrated an inversion to this hypothesis inasmuch as low contrast produced better acquisition than did high

contrast. (See discussion in Paragraph 5.6.1 4 above). This hypothesis was not supported by sub-experiment 4 data.

3 Clutter/Contrast Interaction

The first portion of this hypothesis was rendered inapplicable due to the deletion of the high clutter case from the experimental design after the hypotheses were stated in the Project Plan (see discussion in 5.4.1). The second portion of the hypothesis was supported by the results of the ANOVA (Table 5-III) and the two-way ANOVA for clutter/contrast (Table 5-XII). Also, as shown in Table 5-XIII, medium clutter required a much higher mean time for acquisition than did low clutter under high contrast conditions. However, an inversion was obtained for low contrast conditions wherein medium clutter produced lesser mean times than did low clutter. It is suspected that this inversion was the result of the same factors that caused the inversion discussed in section 5.6.1, 4, above.

5.6.4 Additional Conclusions

1 Observer Effects

The ANOVA for sub-experiment 4 (Table 5-III) showed significant effects from the use of trained Observers versus untrained. The number of acquisitions was higher and the mean time for acquisition was lower for the skilled Observers (Table 5-XIX). In the analysis of clutter/contrast effects by type of Observer (Table 5-XX), the trained Observers were able to maintain a consistently lower mean time to acquire, and also attain a higher number of acquisitions; only in the condition of low clutter/low contrast was the performance difference for Observer types neglible. It would seem (from the results of sub-experiment 4 considered as a complete entity in itself) that trained Observers are definitely superior to untrained Observers. However, it should be remembered that these experiments did not consider the effects of inter-subject variability and no data are available to evaluate this factor.

2 Terrain Table Configuration Effects

Another main effect brought forth by the ANOVA (Table 5-III) was the influence of the various table configurations on the test results of sub-experiment 4. Table 5-XXI shows the best to worst results were obtained in respect to the order of table configurations G, I, J, and H respectively. The reasons for this phenomenon are not discernible from the data at hand, particularly in view of the results from

a two way ANOVA conducted to determine interaction of table configurations and pop-up range (shown as significant by Table 5-III). Table 5-XXIII displays the arithmetical means from the two way ANOVA (Table 5-XXII) with consistency regarding pop-up range influence (discussed in section 5.6.1, 2). However, the same analysis caused an inversion of the best to worst relationship among the four table configurations used.

6.0 SUB-EXPERIMENT 5

6.1 Objectives

As stated in the IB1 Project Plan the primary objectives were to determine target acquisition performance as a function of:

1 Method of search

2 Target and background coloration.

Secondary objectives were determination of target acquisition performance as a function of:

1 Target area clutter

2 Pop-up range to target.

6.2 Experimental Design

The experiment examined in detail the performance of three search methods under four different coloration conditions of varying clutter combinations and two different altitude/range combinations. The three search methods were:

1 Direct visual search without search aids

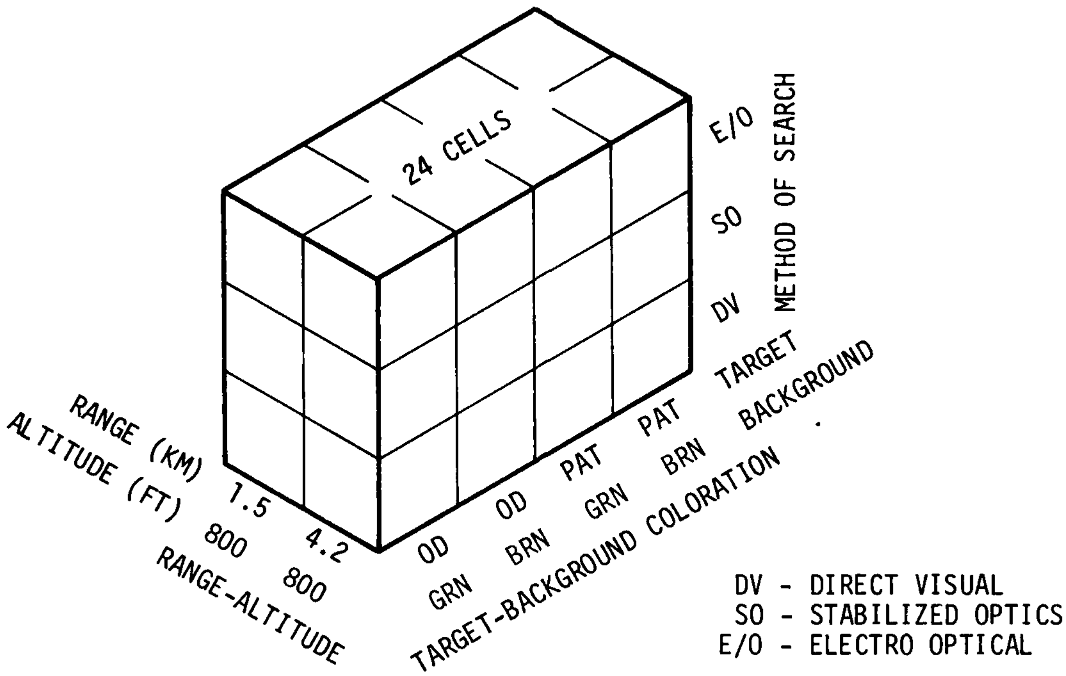
2 Direct visual search in parallel with search using a television sensor using a variable FOV (2 to 8 degrees zoom)(VF)

3 Direct visual search in parallel with search using a simulated stabilized magnifying optical device.

Four Observers, two trained and two untrained, ran identical run sets, giving a total of 384 experimental runs. Both groups were treated as though all individuals in a group were homogeneous.

(4 table configurations) x (3 search modes) x (4 clutter/coloration conditions) x (2 range/altitude combinations) x (4 Observers running identical runs) = 384 experimental runs.

Figure 6-1 illustrates the design of sub-experiment 5.



FACTORS CONSIDERED
- METHOD OF SEARCH - 3 TYPES
- TARGET AND BACKGROUND - 4 LEVELS
- POP-UP RANGE - 2 LEVELS
- CLUTTER - 3 LEVELS - UNVARIED

OBSERVERS REQUIRED
- 18 FOR EACH OF 4 CONFIGURATIONS OF TERRAIN TABLE

MEASURES OF EFFECTIVENESS
- MEAN TIME TO ACQUISITION
- PERCENT OF TARGETS NOT ACQUIRED
- NUMBER OF FALSE ACQUISITIONS

NUMBER OF TARGETS
- 3 PER AREA

NUMBER OF EXPERIMENTAL RUNS
- (24 CELLS) x (4 TABLE CONFIGURATIONS) x (4 OBSERVERS RUNNING IDENTICAL RUNS) = 384

Figure 6-1. Design of Sub-experiment 5

6.3 Hypotheses

Prior to the experiments, the following hypotheses relative to sub-experiment 5 were postulated (reference Project Plan IB1 of October 1974, Annex K, section 5).

1 Clutter will affect target acquisition in the order of best acquisition to worst as low, medium, and high

2 Clutter will interact with contrast such that medium and high clutter conditions will differentially degrade target acquisition; at equivalent levels of contrast target acquisition will be lower with clutter

3 At equivalent contrast levels, background coloration will not cause significant differences in target acquisition of OD painted tanks

4 Camouflaged (pattern painted) tanks will take longer to find than OD painted tanks

5 At equivalent contrast levels, background coloration will not significantly affect target acquisition of camouflaged tanks

6 Clutter will differentially affect target acquisition of camouflaged tanks.

6.4 Method of Accomplishment

6.4.1 General Description

Each of the three search methods was used by different Observers against targets positioned on the terrain table.

The habitat was brought to the simulated altitude of 800 feet and fixed in position. The run was started by the Experimenter at which time the curtain was raised and the terrain remained at a fixed range (1500m or 4200m). The Observer searched until he found the targets or for a maximum of one minute as in sub-experiment 4. Each Observer made four separate runs. Each of the four runs posed a different situation of clutter/coloration while the illumination and contrast were maintained constant.

The instant that the Observer signaled acquisition, a curtain came down in front of him and the elapsed time for the acquisition was recorded. The terrain and habitat were repositioned for the next run. The run was stopped by the Analog Computer Operator after one minute if the Observer failed to acquire the targets.

At the end of each of the four runs, the Experimenter asked the Observer questions about the target (location, number, colors, and direction) to verify correct acquisition. This information was recorded on the Experimenter Check Sheet and also entered into the computer through the use of the keyboard. Then the next run began.

6.4.2 Observers

Observer selection for sub-experiment 5 consisted of:

48	Martin Marietta
33	Army
15	Marines
96	

The runs were made from 27 February 1975 to 6 March 1975.

6.4.3 Terrain Table Layout

Sub-experiment 5 used terrain table configurations K, L, M, and N. Each configuration was divided into four separate target zones. Each area represented a different combination of clutter/coloration.

Clutter was classified as either low, medium, or high. The levels of clutter were defined in terms of the number of target-like objects in the immediate vicinity of the target -- low clutter was represented by no trees in a 200 meter radius circle about the target; medium by 20 trees; and high by 60 trees. Table 6-I shows the rotation pattern of color-clutter through the four table configurations.

TABLE 6-I. CLUTTER-COLORATION/BACKGROUND COMPOSITION OF CONFIGURATIONS K THROUGH N

Target Zone	K	L	M	N
I	M-OD/BR	M-PT/BR	M-PT/GR	M-OD/GR
II	H-OD/GR	H-PT/GR	H-PT/BR	H-OD/BR
III	L-PT/BR	L-OD/BR	L-OD/GR	L-PT/GR
IV	M-PT/GR	M-OD/GR	M-OD/BR	M-PT/BR

The contrast of the individual targets with respect to their backgrounds was maintained constant at approximately 0.50 negative contrast ratio. This was achieved by using colors for the tanks of approximately the same luminance, and by closely controlling the luminance of the backgrounds. Contrast was defined as the difference between the luminance of the target and background divided by the luminance of the background, i.e., $C = (L_T - L_B)/L_B$. The different backgrounds were either brown (BR) or green (GR). The tank colorations were olive drab (OD) and pattern painted camouflage (PT). Actual contrasts are shown in Table 6-II. These figures are the average contrasts of the three target tanks in each zone with respect to the background.

TABLE 6-II. NEGATIVE CONTRAST RATIO OF THE TARGETS FOR CONFIGURATIONS K THROUGH N

Target Zone	K	L	M	N
I	0.52	0.56	0.54	0.51
II	0.50	0.53	0.48	0.50
III	0.54	0.56	0.47	0.51
IV	0.57	0.52	0.51	0.52

6.4.4 Illumination Condition

Overhead fluorescent lighting was used to achieve overcast conditions for all runs in sub-experiment 5.

6.4.5 Measures Used

For each individual run, the time of acquisition was recorded; valid as well as false acquisitions and failures to acquire targets were also recorded.

6.5 Results

Two working procedures were used in the analyses of the data from sub-experiment 5:

1 Any correct acquisition made at the proper location was considered as valid, regardless of how many tanks were reported at that location. Thus, when an Observer reported one, two, three, or more tanks at a proper location this was considered as a valid target acquisition. Only valid acquisitions are considered in the statistical computations

2 All data reporting mean range and the standard deviations thereof are based upon the number of acquisitions made, and do not include unsuccessful acquisition attempts.

Factors in this experiment were method of search, clutter, range, Observer training, target coloration, and background coloration. As in sub-experiment 4 the observed response was detection time in seconds. Also the logarithmic transformation was applied to the data prior to analysis. In this experiment 322 of 384 (84 percent) acquisition attempts were successful.

6.5.1 Analysis of Variance

The ANOVA is shown in Table 6-III. Main effects, two-way interactions, and three-way interactions were included in the model. At the .05 level of significance, the main effects of method of search, range, Observer training, and clutter were significant. The two-way interactions of pop-up range versus clutter and clutter versus background coloration and the three-way interaction of assigned search method versus Observer skill versus target coloration were significant.

6.5.2 Primary Objectives

6.5.2.1 Search Method

Three methods of search were available, unaided direct view (DV), stabilized optic (SO) aid, and an electro-optical television (E/O) aid. In all cases where an aid was assigned, the Observer could (and usually did) use direct vision with the aid as an alternative. Results are presented as a function of both the assigned search method and the actual search method. It is evident that the actual search method used made a significant difference in number of targets acquired. The use of the aid did, in fact, increase the time of acquisition. The data indicate that the majority of the Observers did not use the aid except at the 4200 meter range.

6.5.2.1.1 Assigned Search Method

As in sub-experiment 4, the assigned search method was a significant factor. The DV mode resulted in the quickest detection time and the E/O mode the longest. There is significant difference in the number of acquisitions by search mode. Table 6-IV shows the results for the assigned search modes.

6.5.2.1.2 Actual Search Method

The actual search method resulted in significant differences for both detection time and number of detections. As in sub-experiment 4, there was an overwhelming tendency to disregard the aid and go to the direct visual mode. Approximately 75 percent of the Observers used the DV mode. Results of the actual search method used are shown in Table 6-V.

TABLE 6-III. SUB-EXPERIMENT 5 ANOVA

Source	Sum of Squares	Degrees of Freedom	Mean Square	F Ratio
Assigned Search Method	0.91341	2	0.45671	6.05703*
Range	10.16557	1	10.16557	134.81978*
Observer	1.34471	1	1.34471	17.83406*
Clutter	12.37853	2	6.18927	82.08446*
Target	0.06633	1	0.06633	0.87975
Background Color	0.01630	1	0.01630	0.21622
Assigned Search Method/Range	0.01606	2	0.00803	0.10648
Assigned Search Method/Observer	0.35399	2	0.17700	2.34741
Assigned Search Method/Clutter	0.72506	4	0.18127	2.40402
Assigned Search Method/Target Color	0.21824	2	0.10912	1.44718
Assigned Search Method/ Background Color	0.07331	2	0.03665	0.48611
Range/Observer	0.00533	1	0.00533	0.07074
Range/Clutter	2.08065	2	1.04033	13.79720*
Range/Target Color	0.01902	1	0.01902	0.25229
Range/Background Color	0.00640	1	0.00640	0.08491
Observer/Clutter	0.04503	2	0.02251	0.29859
Observer/Target Color	0.00003	1	0.00003	0.00043
Observer/Background Color	0.05604	1	0.05604	0.74327
Clutter/Target Color	0.21480	2	0.10740	1.42438
Clutter/Background Color	0.48375	2	0.24188	3.20786*
Target Color/Background Color	0.06895	1	0.06895	0.91466
Assigned Search Method/Range/ Observer	0.42342	2	0.21421	2.84093
Assigned Search Method/Range/ Clutter	0.22136	4	0.05534	0.73395
Assigned Search Method/Range/ Target	0.03226	2	0.01613	0.21394
Assigned Search Method/Range/ Color	0.14383	2	0.07191	0.95375

TABLE 6-III. SUB-EXPERIMENT 5 ANOVA (Cont)

Source	Sum of Squares	Degrees of Freedom	Mean Square	F Ratio
Assigned Search Method/ Observer/Clutter	0.18422	4	0.04606	0.61080
Assigned Search Method/ Observer/Target Color	0.46918	2	0.23459	3.11134*
Assigned Search Method/ Observer/Background Color	0.12012	2	0.06006	0.79655
Assigned Search Method/Clutter/ Target Color	0.04828	4	0.01207	0.16007
Assigned Search Method/Clutter/ Background Color	0.28166	4	0.07192	0.95378
Assigned Search Method/ Background Color/Background Color	0.04574	2	0.02287	0.30330
Assigned Search Method/ Observer/Clutter	0.37671	2	0.03836	0.50871
Range/Observer/Target Color	0.16511	1	0.16511	2.18979
Range/Observer/Target Color	0.16985	1	0.16985	2.25261
Range/Clutter/Target Color	0.05600	2	0.02800	0.37132
Range/Clutter/Background Color	0.10236	2	0.06118	0.67880
Observer/Clutter/Target Color	0.10236	2	0.19127	2.53673
Observer/Clutter/Background Color	0.12247	2	0.06123	0.81209
Clutter/Target Color/Background Color	0.30887	2	0.15444	2.04819
Error	18.47330	245	0.07540	

*Significant at the .05 level

TABLE 6-IV. ASSIGNED SEARCH METHOD RESULTS (SIGNIFICANT DIFFERECNE $F(2,245) = 6.06$)

Assigned Search Method	Mean Time ($\bar{x}$)	Median (X.50)	Standard Deviation ($\hat{\sigma}$)	Sample Size (N)
DV	7.70s	3.40	10.42	100
DV + SO	9.82s	6.20	10.18	116
DV + EO	12.42s	5.25	14.31	106

Chi-square ($\chi^2 = 7.54$, DF = 2) Significant

TABLE 6-V. ACTUAL SEARCH METHOD USED

Assigned Search Method	Mean Time ($\bar{x}$)	Median (X.50)	Standard Deviation ($\hat{\sigma}$)	Sample Size (N)
DV	6.22s	3.35	8.52	241
DV + SO	16.19s	14.70	9.65	49
DV + EO	29.16s	27.80	14.29	32

Chi-square ($\chi^2 = 22.12$, DF = 2) Significant

6.5.2.2 Target and Background Coloration

Neither target nor background coloration proved to be a significant factor. There was, however, an interaction between background coloration and clutter, as discussed in section 6.5.3.1. Tables 6-VI and 6-VII show the results for coloration.

TABLE 6-VI. TARGET COLORATION (NO SIGNIFICANT DIFFERENCE $F(1,245) = .88$)

Target Coloration	Mean Time ($\bar{x}$)	Median (X.50)	Standard Deviation ($\hat{\sigma}$)	Sample Size (N)
Olive Drab (OD)	9.69s	4.50	11.22	161
Pattern Painted (PT)	10.34s	5.30	12.53	161

Chi-square ($\chi^2 = 0.02$, DF = 1) Not significant

TABLE 6-VII. BACKGROUND COLORATION
(NO SIGNIFICANT DIFFERENCE
F (2,245) = .22)

Background Coloration	Mean Time ($\bar{x}$)	Median (X.50)	Standard Deviation ($\hat{\sigma}$)	Sample Size (N)
Brown	10.75s	5.00	12.72	157
Green	9.31s	4.50	11.02	165

Chi-square (χ^2 = 0.94, DF = 1) Not significant

6.5.3 Secondary Objectives

6.5.3.1 Clutter

As in the other experiments, clutter was a significant factor. Increases in the level of clutter caused an increase in detection time, although in this experiment there was no significant difference between the medium and high levels of clutter. Table 6-VIII shows the results for clutter.

TABLE 6-VIII. EFFECTS OF CLUTTER
(SIGNIFICANT DIFFERENT
F(2,245) = 82.08)

Clutter Level	Mean Time ($\bar{x}$)	Median (X.50)	Standard Deviation ($\hat{\sigma}$)	Sample Size (N)
Low	3.75s	2.30	4.02	94
Medium	11.98s	6.80	12.61	155
High	13.90s	7.90	13.90	73

Chi-square (χ^2 = 19.74, DF = 2) Significant

There was an interaction between clutter and background coloration and also an interaction between clutter and range. Tables 6-IX and 6-X show the effects of coloration and clutter at the 1500 meter and 4200 meter range. At the low and high levels of clutter there was no difference between the brown and green background. However, at the medium level of clutter the detection time for green background is greater than for the brown background.

Table 6-XI presents the total target acquisitions (in number of targets) and detection time (in seconds) for coloration alone.

TABLE 6-IX. EFFECTS OF COLORATION AND CLUTTER
800 FEET ALTITUDE, 1500 METERS RANGE

	Target/Background Coloration											
	OD/BR			OD/GR			PT/BR			PT/GR		
Clutter	Number	Median (X.50)	Mean Time ($\bar{x}$)	Number	Median (X.50)	Mean Time ($\bar{x}$)	Number	Median (X.50)	Mean Time ($\bar{x}$)	Number	Median (X.50)	Mean Time ($\bar{x}$)
Low	12	1.6	3.6s	12	1.65	2.41s	12	2.45	2.79s	12	1.35	2.2s
Medium	23	4.7	9.49s	23	3.1	4.5s	22	4.95	7.05s	22	3.65	7.24s
High	12	3.3	3.77s	12	4.85	9.89s	12	5.3	8.38s	12	5.40	10.01s

TABLE 6-X. EFFECTS OF COLORATION AND CLUTTER
800 FEET ALTITUDE, 4200 METERS RANGE

	Target/Background Coloration											
	OD/BR			OD/GR			PT/BR			PT/GR		
Clutter	Number	Median (X.50)	Mean Time ($\bar{x}$)	Number	Median (X.50)	Mean Time ($\bar{x}$)	Number	Median (X.50)	Mean Time ($\bar{x}$)	Number	Median (X.50)	Mean Time ($\bar{x}$)
Low	11	2.9	3.78s	12	3.95	7.57s	11	4.2	4.92s	12	2.4	3.38s
Medium	13	16.2	24.35s	17	14.8	15.28s	15	20.6	21.21s	20	10.95	16.34s
High	8	22.15	22.36s	6	17.55	20.03s	6	25.75	28.4s	5	29.60	32.12s

TABLE 6-XI. EFFECTS OF COLORATION ON NUMBER AND TIME (SECONDS) OF TARGET ACQUISITIONS

	Altitude/Range					
	800 feet/1500 meters			800 feet/4200 meters		
Coloration	Number	Median ($X_{.50}$)	Mean Time ($\bar{x}$)	Number	Median ($X_{.50}$)	Mean Time ($\bar{x}$)
OD/GR	47	2.9	5.34s	35	14.2	13.45s
OD/BR	47	3.4	6.39s	32	12.2	16.78s
PT/GR	46	3.0	6.22s	37	10.0	14.27s
PT/BR	46	3.75	6.71s	32	10.35	16.96s

6.5.3.2 Pop-up Range

The ANOVA showed range to be a significant factor as it was in sub-experiment 4. At 4200 meters the detection time was over twice that at 1500 meters. Also there was a decrease in the number of acquisitions at 4200 meters. Table 6-XII shows the results for the two ranges.

TABLE 6-XII. EFFECT OF RANGE (SIGNIFICANT DIFFERENCE $F(1,245) = 134.82$)

Range	Mean Time ($\bar{x}$)	Median ($X_{.50}$)	Standard Deviation ($\hat{\sigma}$)	Sample Size (N)
1500m	6.16s	3.20	8.63	186
4200m	15.28s	10.95	13.60	136

Chi-square ($\chi^2 = 46.18$, DF = 1) Significant

As mentioned in Section 6.5.3.1 there was an interaction between range and clutter. At the longer range the detection time showed a larger increase at the medium and high levels than at the low clutter level. Table 6-XIII shows the ANOVA for this interaction.

TABLE 6-XIII. RANGE VERSUS CLUTTER

Source	Sum of Squares	Degrees of Freedom	Mean Square	F Ratio
Range	10.83103	1	10.83103	130.35*
Clutter	12.51166	2	6.255A3	75.29*
Range x Clutter	1.70514	2	0.85257	10.26*
Error	26.25778	316	0.08309	

*Significant at the .05 level

6.5.4 Additional Results

Observer training was also significant in this sub-experiment. The trained Observer tended to acquire more targets faster than the untrained. Trained Observers made 170 correct acquisitions, untrained made 152. The difference in number of acquisitions was not significant, although differences in time of acquisition were significant. Mean time for trained was 9.25 seconds with a standard deviation of 11.68, for untrained the mean time was 10.87 seconds with a standard deviation of 12.08. Median values were 4.4 seconds for trained Observers and 5.7 seconds for untrained, as seen in Table 6-XIV. The homogeneity of the two groups is not known.

TABLE 6-XIV. OBSERVERS
(SIGNIFICANT DIFFERENCE
$F(1,245) = 17.83$)

Observers	Mean Time ($\bar{x}$)	Median ($X_{.50}$)	Standard Deviation ($\hat{\sigma}$)	Sample Size (N)
Trained	10.87s	5.75	12.08	152
Untrained	9.25s	4.55	11.68	170

Chi-square ($\chi^2 = 5.56$, DF = 1) Significant

6.6 Conclusions

6.6.1 Primary Objective

6.6.1.1 Method of Search

As found in sub-experiment 4, the effect of search method in sub-experiment 5 was emphatic for the samples tested. The ANOVA (Table 6-III) found significance in the assigned search method when examined with respect to the time of acquisition, and further examination (Table 6-IV)

showed assigned search method significant. When actual search method used was addressed, significance was found in both time and numbers (Table 6-V). Both treatments showed DV was most effective in terms of search time followed by SO and EO, in that order. The increase in the DV sample size resulting from the actual use treatment shows nearly three times as many acquisitions in that mode. Not only did the Observers prefer direct view, it was the most effective overall. Again, as in sub-experiment 4, the ranges used in the experiment are concluded to be rather short to provide an effective evaluation of the aided search methods selected. However the objective was served in that the relative utility of the three search methods was demonstrated for ranges of 1500 and 4200 meters. As stated before, however, the truncation of data cells could negate the validity of the samples as being representative of the population.

6.6.1.2 Target and Background Coloration

These factors were shown not significant (See Tables 6-III, 6-VI, and 6-VII) although an interaction did develop between background coloration and clutter. This objective of the sub-experiment was met.

6.6.2 Secondary Objectives

6.6.2.1 Clutter

This factor was again shown to be significant (see Tables 6-III and 6-VIII). Clutter behaved as expected in that detection time varies directly with clutter level. Further, clutter showed interaction with background coloration and range. The medium level of clutter produced consistenly different acquisition times for green and brown backgrounds; the other two levels showed no consistent pattern differential (Table 6-XI). When clutter is a constant, search time increases with range, but differentially for low clutter and medium/high clutter (Tables 6-IX and X). The data do not appear to offer an easy explanation for the interaction, but the clutter-related objective was met in that once again clutter demonstrated a major influence on target acquisition within the actual test parameters examined.

6.6.2.2 Pop-up Range

The ANOVA (Table 6-III) and the analysis presented in Table 6-XII clearly demonstrated range to be a dominant factor in this sub-experiment. It is concluded that the experimental designs met this objective and that pop-up range behaves in the expected manner.

6.6.3 Hypothesis Correlations

6.6.3.1 Clutter

The hypothesis that clutter will affect target acquisition in the order of best acquisition to worst as low, medium, and high was supported by this sub-experiment. As noted in 5.6.2.1, clutter was significant and affected target acquisition as predicted.

6.6.3.2 Background Color

The hypothesis that, at equivalent contrast levels background color will not cause significant differences in target acquisition of OD or pattern painted tanks, was supported by this sub-experiment. The experiment demonstrated no significant effects due to target and background coloration.

6.6.3.3 Camouflage

The hypothesis that camouflaged (pattern painted) tanks will take longer to find than OD painted tanks was not supported by this sub-experiment. A slight difference in the hypothesized direction was found as shown in Table 6-VI, but the differential fails to be significant by a wide margin (Table 6-III).

6.6.3.4 Clutter/Camouflage

The hypothesis that clutter will differentially affect target acquisition of camouflaged and OD tanks was not supported. No interaction of clutter and target coloration was found.

6.6.4 Additional Results

The trained Observers demonstrated a significant superiority over untrained Observers in terms of time of acquisition. This result is consistent with the results of the other rotary wing sub-experiment. No data were obtained regarding intersubject variability.

7.0 SUMMARY EFFECTS OF CONTROLLED EXPERIMENTAL VARIABLES

This section presents the results of the five sub-experiments of the IB1 experiment. Specifically, the relative effect of the experimental factors on target acquisition probability and range are examined. There were nine experimental factors - eight of these were explicit, being either primary or secondary in one or more of the sub-experiments, while one, Observer training, was implicit in the experimental design in that every cell contained a balanced sample of trained and untrained Observers. Caution should be exercised in accepting these results as being definitive because the observers' option in visual aid use in effect caused the nested design of the tests to become a cross design. Also, target arrays could have provided each observer with some cue to location in his second run. This second possibility was accepted because the use of another arrav would have introduced another variable to the experiments. Table 7-1 presents a summary of the relative influence of each factor in each of the actual experiments as they developed under the optional use of the aids.

TABLE 7-I. RELATIVE INFLUENCE OF EXPERIMENTAL FACTORS

Factors	Sub-experiment				
	1	2	3	4	5
Method of Search	Significant	Minor	Significant	Major	Major
Clutter	Major	Significant	Significant	Major	Major
Contrast	Minor	Minor	Minor	Significant	No Factor
Illumination Angle	Minor	No Factor	Minor	No Factor	No Factor
Number of Targets	No Factor	Significant (Range only)	No Factor	No Factor	No Factor
Pop-up Range	No Factor	No Factor	No Factor	Major	Major
Pop-up Altitude	No Factor	No Factor	No Factor	Minor	No Factor
Coloration	No Factor	No Factor	No Factor	No Factor	Minor
Observer Training	Minor	Minor	Minor	Significant	Significant

Definitions:

Major = Statistically significant and exerted powerful influence on the results.

Significant = Statistically significant but not overpowering.

Minor = Not statistically significant, but some influence or conflicting trends noted.

No Factor = Not a factor in the experiment.

The paragraphs that follow address the effects of each of the nine experimental factors individually.

7.1 Method of Search

This variable was the second most influential in the overall IBl experiment, being surpassed only by clutter. Unlike clutter, search method did not display a consistent direction of influence. In the fixed wing experiments, the use of the three aided modes either improved, or at least did not adversely influence, target acquisition range when compared to direct view. In the rotary wing experiments, however, the aids universally degraded target acquisition times by a large margin although a possible error of interpopulation could have been introduced. Tables 7-II and 7-III illustrate these points.

TABLE 7-II. FIXED WING SEARCH METHOD COMPARISONS

Search Method	Mean Acquisition Ranges (Meters)			
	Sub-Experiment 1	Sub-Experiment 2	Sub-Experiment 3	Overall Fixed Wing
DV	4401	4391	5521	4768
DV + NF	4559	4606	5282	4752
DV + WF	5189	4366	5429	5154
DV + VF	4942	5039	5049	4977

TABLE 7-III. ROTARY WING SEARCH METHOD COMPARISONS

Search Method	Mean Acquisition Times (Seconds)		
	Sub-Experiment 4	Sub-Experiment 5	Overall Rotary Wing
DV	4.49	6.22	4.95
DV + EO	22.29	29.16	24.76
DV + SO	14.37	16.19	15.16

When numbers of acquisition are considered, the direct visual mode clearly dominates (Table 7-IV); however, this cannot be used to infer that the use of the aids lowered the probability of acquisition. Since many Observers assigned aids elected not to use them, the sample sizes for the various search methods was grossly unbalanced.

In terms of mean acquisition ranges, the wide field of view was the most successful of the aids in the fixed wing experiments, followed closely by the variable field. In the rotary wing experiments, the stabilized optics were markedly superior to the electro/optical aid, although again the truncated nature of the data causes the validity to be inconclusive.

TABLE 7-IV. TARGET ACQUISITION TOTALS BY SEARCH METHOD

Search Method	Numbers of Targets Acquired				
	Sub-Experiment 1	Sub-Experiment 2	Sub-Experiment 3	Sub-Experiment 4	Sub-Experiment 5
DV	130	29	78	660	241
DV + NF	55	11	23		
DV + WF	56	13	30		
DV + VF*	66	9	24	57	32
DV + SO				64	49

*Variable Field in fixed wing and electro-optical in rotary wing used the same device except for the initial aiming system.

When viewed in terms of cumulative probability of detection, as seen in Figure 7-1, the wide field of view provided the highest cumulative probability of acquisition of the three aids. It was, however, inferior to the other two beyond about 5500 meters range, probably because the visual angle subtended by targets beyond this range was too small in the wide (8 degree) field of view. The probability of acquisition curves derived from the rotary wing sub-experiments clearly support the superiority of the stabilized optics (Figure 7-2). Here again, the possible error of interpopulation might have influenced the results.

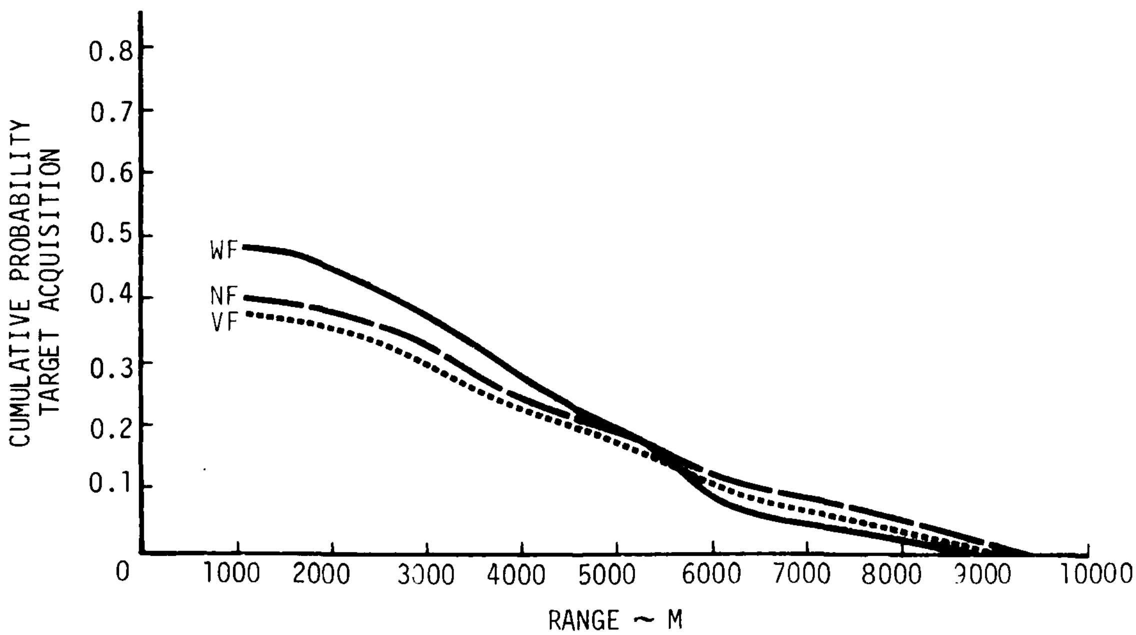


Figure 7-1. Effect of Aided Search Method, Fixed Wing

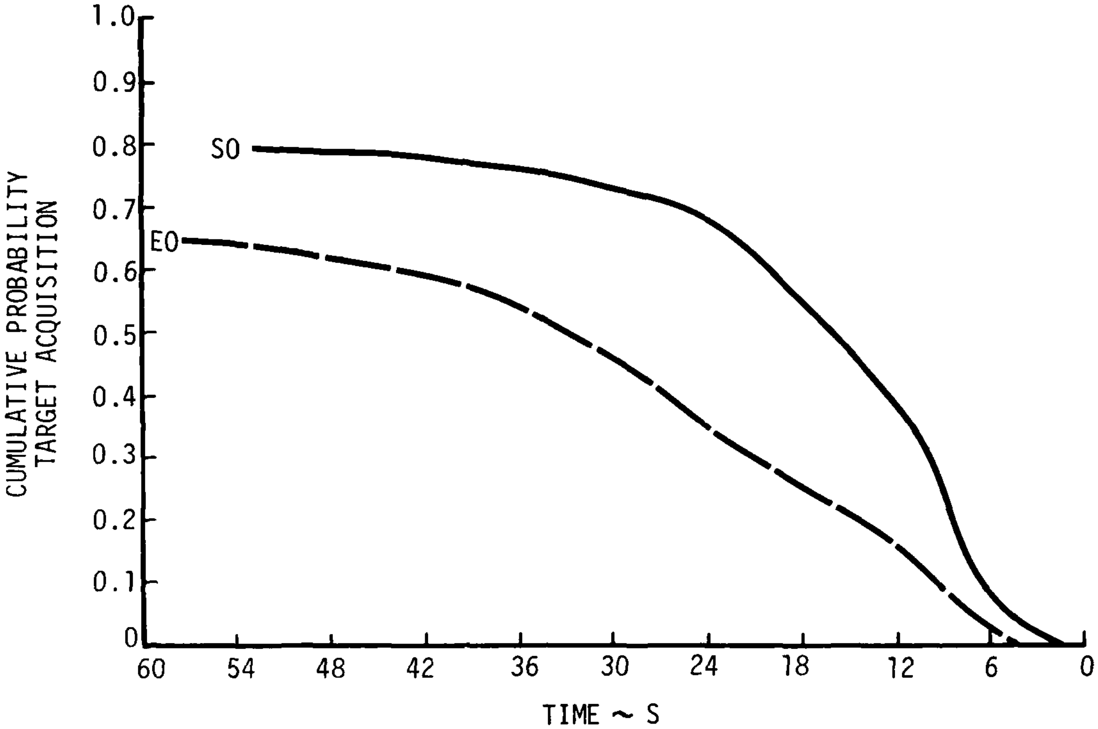


Figure 7-2. Effect of Aided Search Method, Rotary Wing

7.2 Clutter

Clutter was the most influential variable in the overall IB1 experiment, having either major or significant influence in all the sub-experiments, as shown in Table 7-I.

Clutter significantly reduced the probability of target acquisition in both the fixed and rotary wing experiments. Figure 7-3 shows the cumulative probability of acquisition recorded in sub-experiments 1, 2, and 3 as a function of clutter condition (low = no, medium = 20, and high = 60 clutter items in the immediate target area). Figure 7-4 shows probability of acquisition as a function of clutter for the helicopter experiments.

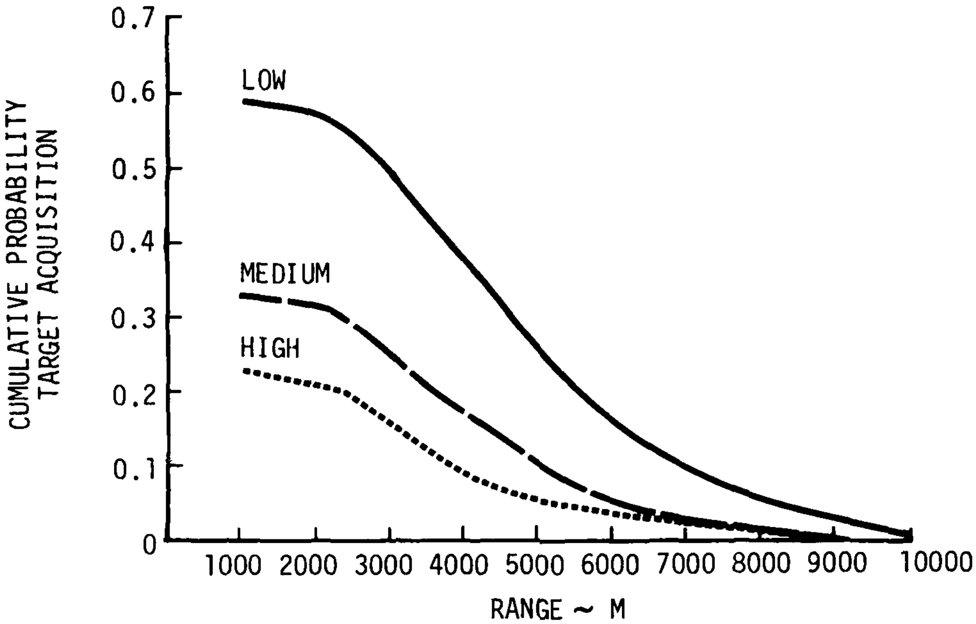


Figure 7-3. Effect of Clutter on Target Acquisition Range, Fixed Wing

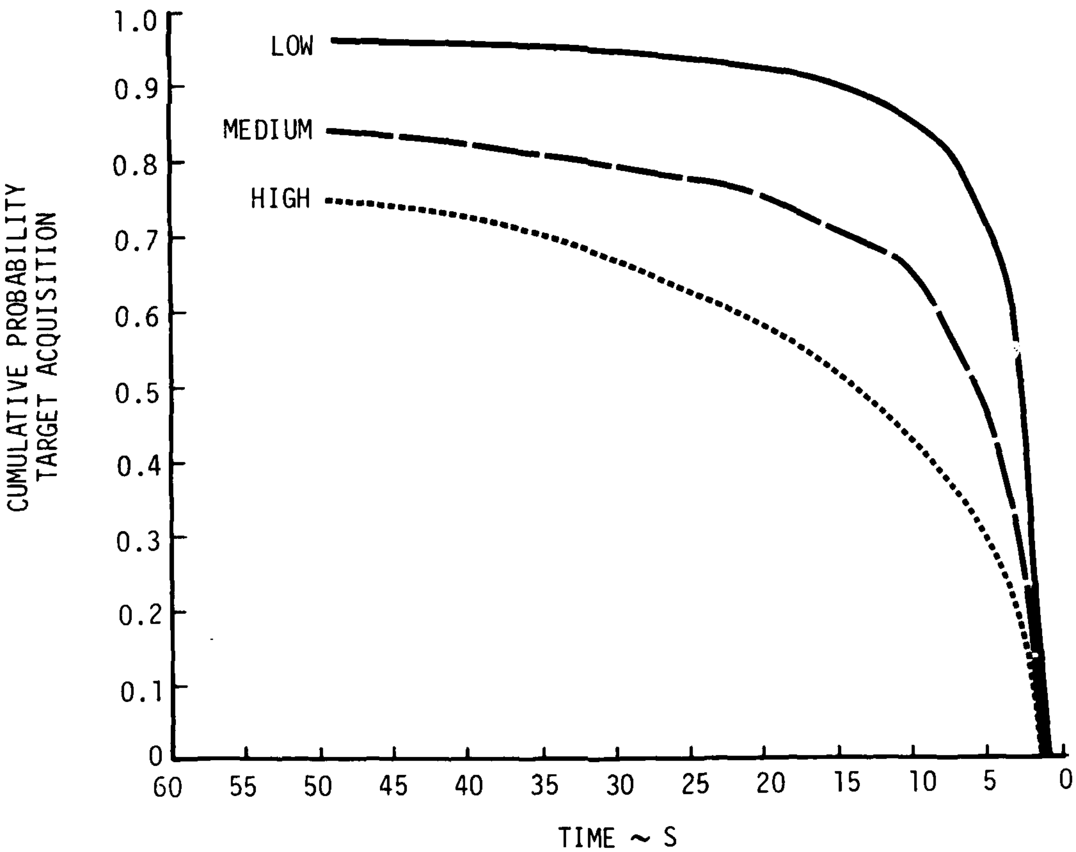


Figure 7-4. Effect of Clutter on Search Time, Rotary Wing

7.3 Contrast

Contrast, as an independent variable, only had a minor effect on the experimental results of three of the four sub-experiments and was significant only in sub-experiment 4. On the other hand, contrast, as is evident in Figure 7-5, interacted strongly with clutter. Where clutter was not present, however, high contrast targets were found at slightly longer ranges with a higher probability of acquisition than low contrast targets in the fixed wing sub-experiments. In all fixed-wing sub-experiments combined, the mean range of acquisition in low clutter was 5099 meters for high contrast targets, and 4974 meters for low contrast. In sub-experiment 4, however, mean acquisition time at low clutter was 5.97 seconds for high contrast targets and 5.57 seconds for low contrast targets. Thus, the contrast effect was equivocal in the low clutter case.

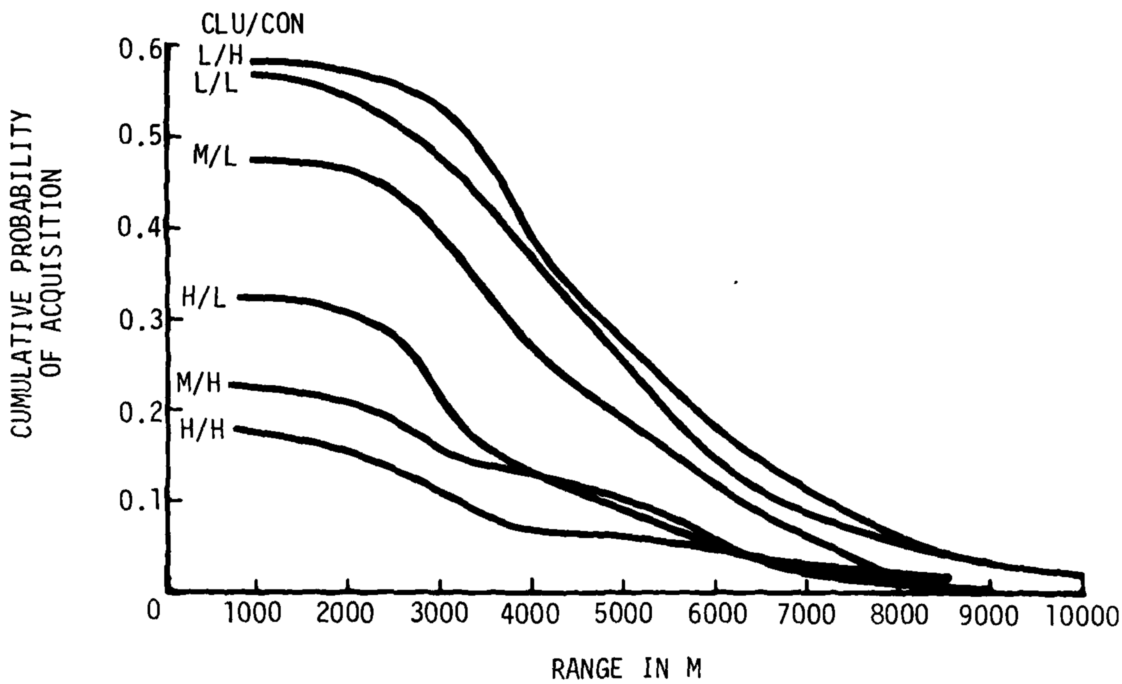


Figure 7-5. Interaction Effects of Clutter/Contrast, Fixed Wing

When clutter was present, contrast appeared to produce a reverse effect. As shown in Figure 7-5, low contrast targets were found at longer ranges than high contrast targets under both medium and high clutter conditions. This result was unexpected. However, there are two likely explanations. First, the result may be an effect of target-to-clutter contrast. Contrast as an experimental variable, was measured directly comparing targets to their immediate surroundings. In the experiments where contrast was varied, the background was essentially a light green, simulating meadow or prairie. High contrast tanks were painted military OD with a green hue added to obtain an approximate target to background contrast ratio of -0.60. The result was a relatively dark green target on a lighter green background. Low contrast tanks were painted with beige to achieve an approximate target to background contrast ratio of -0.40. The result was a sandy (or beige) tone on a light green background. Clutter was then applied by placing trees and bushes randomly around the targets. When measured, the contrast ratio of the clutter items to the background was approximately the same as with high contrast targets, i.e., -0.60. Since the low contrast tanks were distinguishable from the surrounding higher contrast clutter elements by both their color and contrast with respect to the background, they were possibly easier to detect than the high contrast tanks which were more nearly like the clutter in both color and contrast. The failure to consider color and contrast in selection of the clutter elements may have weakened this phase of the experiments.

A second possible explanation may be the effect of texture differences. The tank targets had flat surfaces and obvious smooth planes. The clutter items were rough textured trees and bushes. The small color and brightness differences between tank and clutter in the low contrast situations thus could have accentuated texture differences.

7.4 Illumination Angle

This factor, which was a variable in only two of the sub-experiments, proved to have only a minor influence.

Two results are evident from the data on illumination effects. First, rate of acquisition is slightly better at 40 degrees sun elevation than at 20 degrees (48.3 percent versus 32.3 percent, as seen in Figure 7-6). Second, as sun azimuth changes from 0 to 180 degrees*, the rate of acquisition, too, decreases. Further, the variability of acquisition increases with increasing sun azimuth. Table 7-V presents the combined data from sub-experiments 1 and 3.

*Sun azimuths in the SEEKVAL convention are given such that at 0 degree the Observer is looking down sun (target front lighted) and at 180 degrees the Observer is looking into the sun (target back lighted).

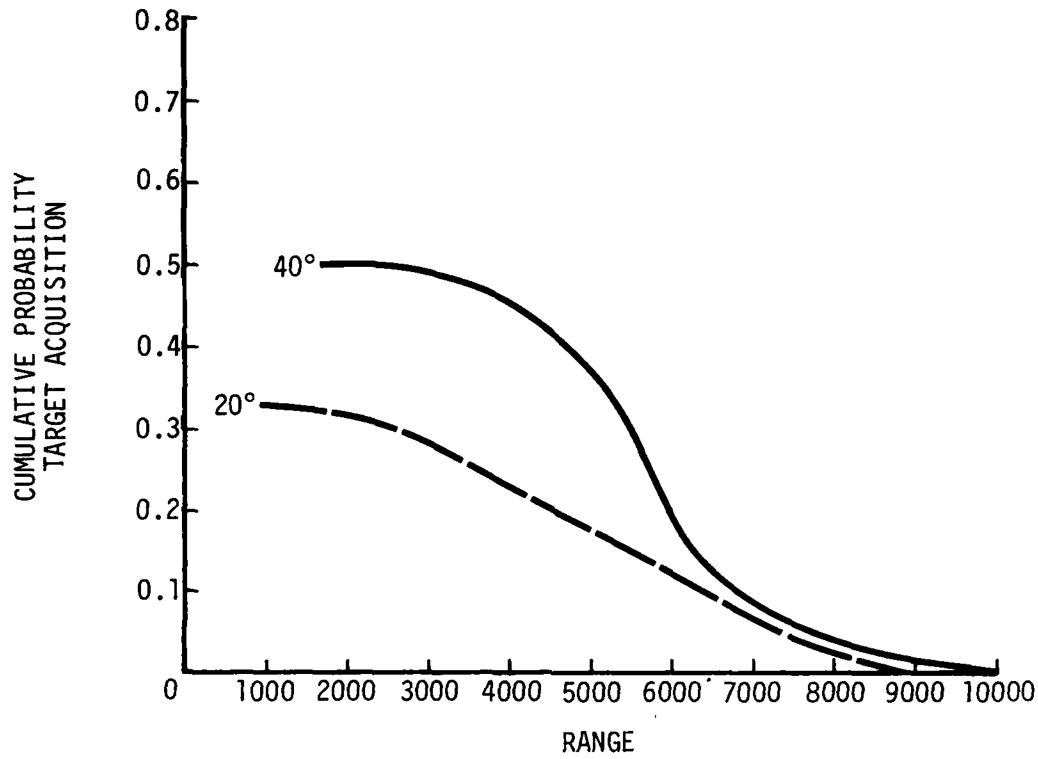


Figure 7-6. Effect of Sun Elevation Angle on Probability of Target Acquisition

Figures 7-7, 7-8, 7-9, and 7-10 compare the probability of acquisition at 20 and 40 degrees sun elevations for the 45, 90, 135, and 180 degree azimuth conditions. Where appropriate, data from all terrain table configurations used in sub-experiment 1 are included for the 40 degrees sun elevation. As noted in section 2.5, the differences are not significant. The trends evidence a small tendency for better acquisition at 40 degrees sun elevation than at 20 degrees.

TABLE 7-V. EFFECTS OF ILLUMINATION COMBINED DATA FOR EXPERIMENTS 1 AND 3

Sun Azimuth (degrees)	Mean Acquisition Range	Standard Deviation	Co-efficient* Variation	Number of Acquisitions	Number of Attempts	Probability of Acquisition
Sun Elevation - 20 degrees						
45	5830m	1796	0.308	24	48	0.50
90	4298m	1878	0.437	15	45	0.33
135	6047m	2445	0.404	12	48	0.25
180	4975m	2412	0.485	10	48	0.20
Sun Elevation - 40 degrees						
0	5669m	1119	0.197	26	48	0.54
45	5623m	1379	0.240	22	48	0.56
90	4879m	1936	0.397	133	287	0.46
135	4274m	1751	0.410	89	288	0.31
180	4821m	2296	0.476	97	288	0.34
Overcast Sky						
---	4546m	1902	0.418	120	286	0.42

*Coefficient of variation = standard deviation divided by the mean

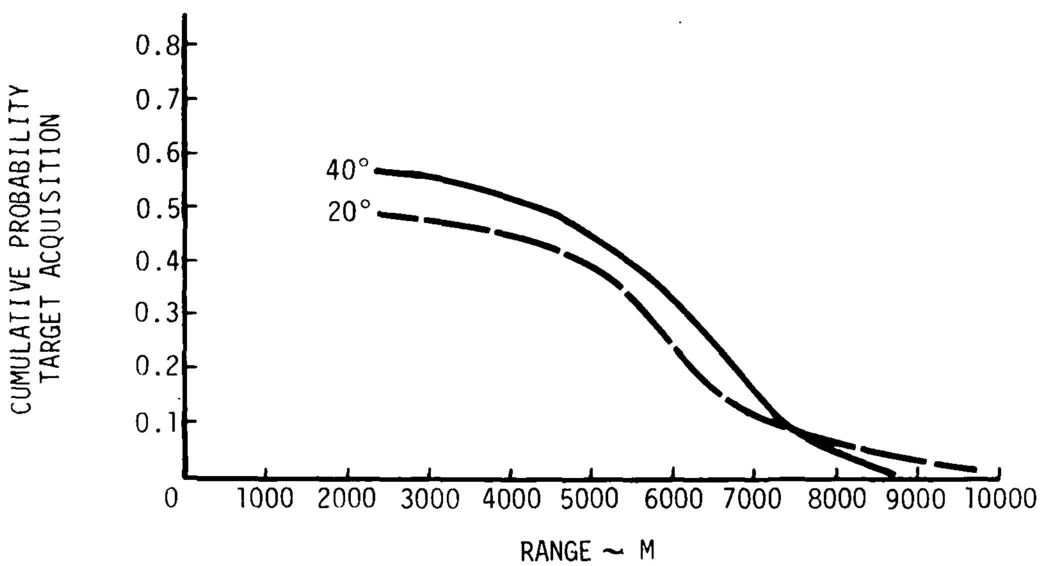


Figure 7-7. Effect of Sun Angle, 45 Degrees Azimuth

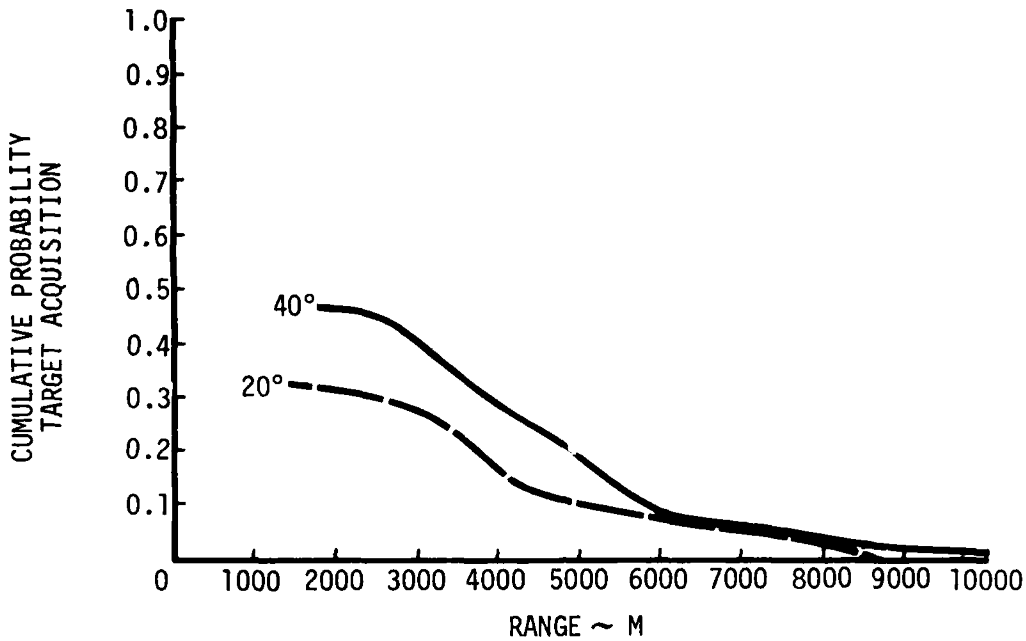


Figure 7-8. Effect of Sun Angle, 90 Degrees Azimuth

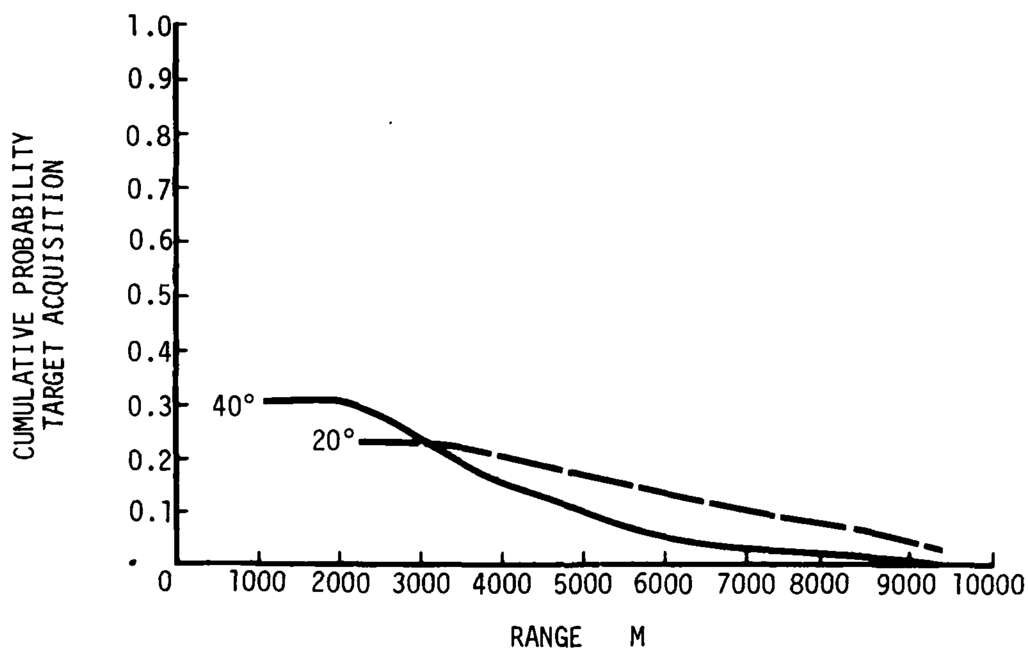


Figure 7-9. Effect of Sun Angle, 135 Degrees Azimuth

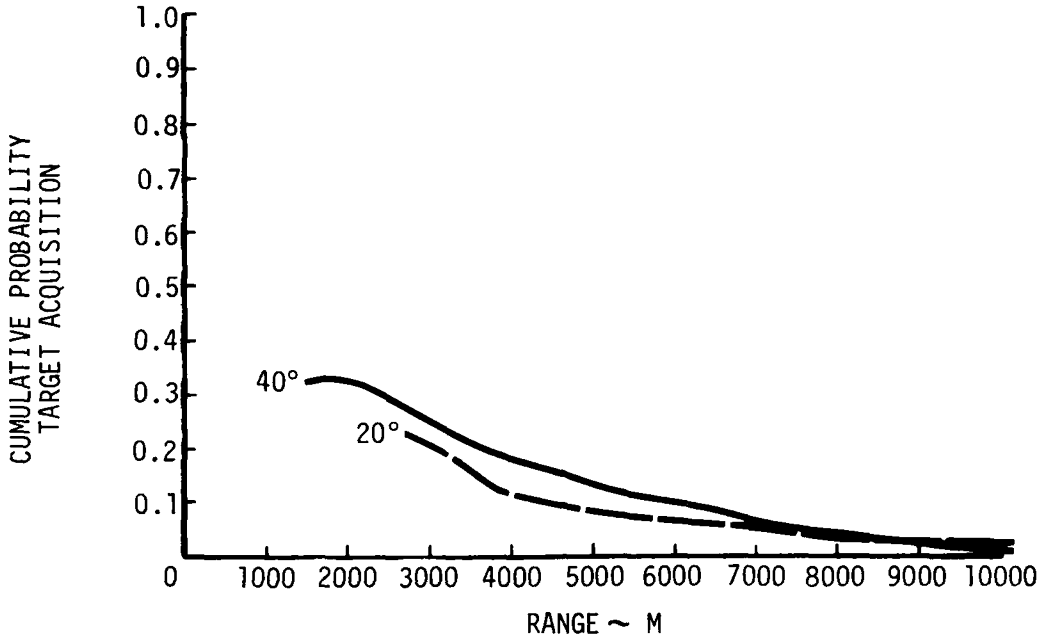


Figure 7-10. Effect of Sun Angle, 180 Degrees Azimuth

The SEEKVAL IA1 Experiment likewise reported no significant difference in target acquisition performance at 0, 90, and 180 degrees sun azimuths in a terrain table experiment.

It is noted that the data for overcast sky are representative of general illumination conditions. The mean range, standard deviation, coefficient of variation and percentage targets acquired are all at the approximate mid-point of values for the illumination conditions tested, as seen in Table 7-V. This implies that use of "overcast sky" in the other experiments was a reasonable choice, which neither conflicted with nor degraded the results.

7.5 Number of Targets

Sub-experiment 2, the only one in which the number of targets was a factor, showed that this factor had a significant impact on target acquisition performance. Because this was a smaller test than the others, the truncated data may have caused an even greater possibility of the results not being representative of the entire population. Observers acquired target arrays of one, three, and nine tanks in ascending order of effectiveness. It is interesting to note, however, that only one Observer correctly reported nine tanks in an array. Most Observers, confronted with this array reported 3 to 5. Thus, although the nine tank arrays were most easily acquired, the true strength of the formation did not become apparent.

7.6 Pop-up Range

The two helicopter sub-experiments (4 and 5) in which this variable was present showed range to have major influence over the target acquisition process. Figure 7-11 shows the cumulative probability of detection as a function of range for sub-experiments 4 and 5 combined. The effect is as expected and quite pronounced.

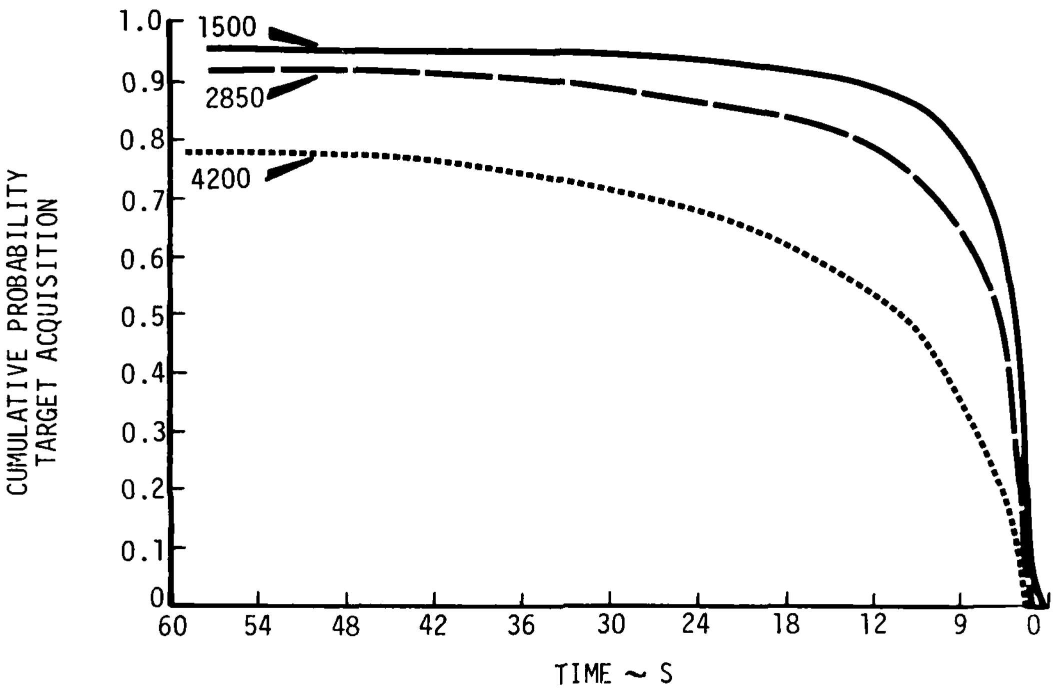


Figure 7-11. Effect of Pop-Up Range, Rotary Wing

7.7 Pop-up Altitude

Altitude, a variable only in sub-experiment 4, proved to have only minor effect on target acquisition. Figure 7-12 displays the cumulative probability of detection as a function of this variable. This result should not be interpreted as indicating that altitude has no value for target acquisition since the altitudes used are not representative of the tactical pop-up maneuver and probably lie well beyond the altitudes where the aspect angle, and hence the visibility of ground targets, is changing most rapidly. The limitations of an experiment in which a seated Observer must be transported over a terrain model in subscale dictated the high altitudes used. Keeping all dimensions to a minimum, the minimum distance of the Observer's eye to the terrain table surface was 4 feet, hence the

800 foot minimum altitude at the 200:1 scale. It is concluded that this constraint weakened the experiment with respect to this variable to the point that the results are of little value.

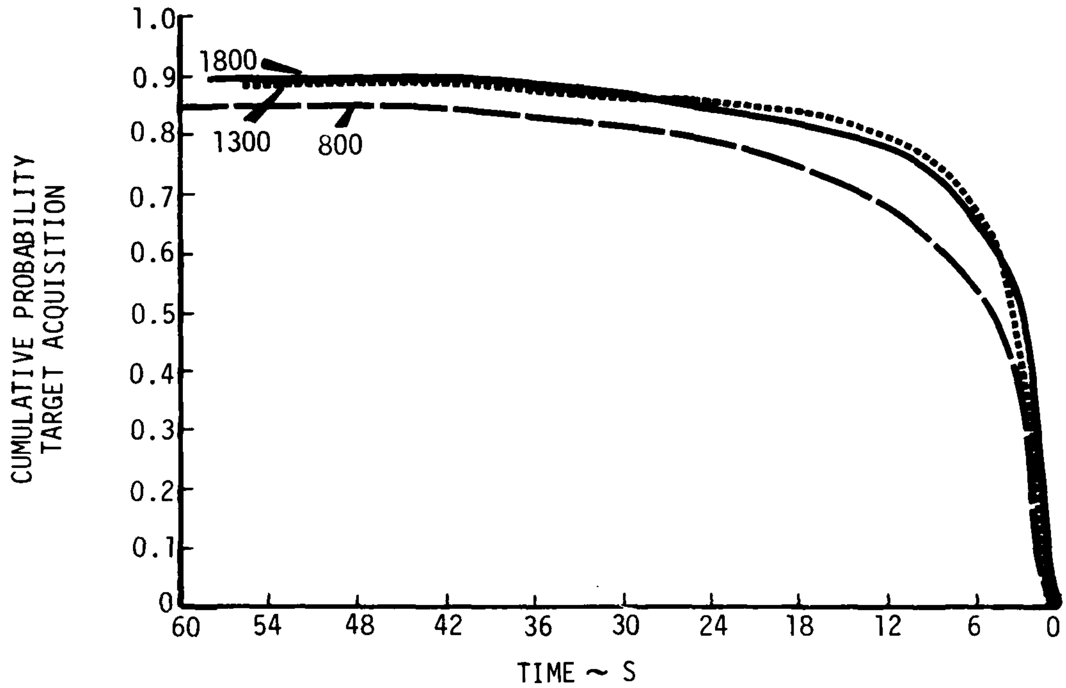


Figure 7-12. Effect of Altitude, Rotary Wing

7.8 Target and Background Coloration

In sub-experiment 5, the only sub-experiment in which coloration was a variable, the effects of color were minor.

The negligible effect of target coloration was not expected. Subjectively, the pattern painted tank appeared to be different from the OD. In the SEEKVAL IA1 experiment, target acquisition time for green and brown tanks was significantly better than that for grey tanks; the search time differences between green and brown tanks were not significant. Sub-experiment 5 appears to parallel the results reported in IA1 in that OD and pattern painted coloration differences were not significant while beige was different. Detailed analyses of the impact of target coloration were made in several ways to try to determine whether clutter, range, search method, Observer experience, or background color were in any way influencing the results. No interactions or trends were apparent. It must

be concluded that the target coloration used in sub-experiment 5 had no effect upon target acquisition performance. Figure 7-13 presents the effect of target coloration on cumulative probability of target acquisition.

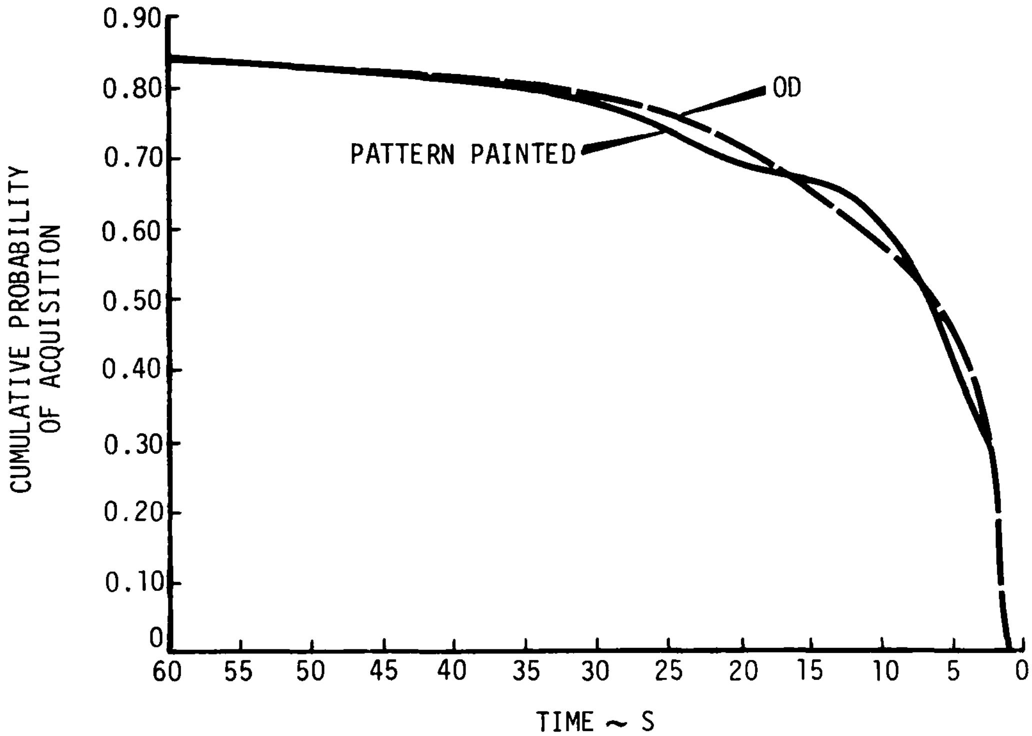


Figure 7-13. Effect of Target Coloration on Target Acquisition

The data from the other four sub-experiments indicate that certain target colorations may be important, in spite of the results cited above. As reported, the low contrast targets (lighter colored) were usually acquired more rapidly but not always at longer ranges than were the higher contrast targets. While this result does not agree with the predicted effects of contrast, it is similar to that reported in Experiment IA1 for grey tanks.

The effects of background coloration were slightly more pronounced than those of target colors, but not significant. It will be noted from Figure 7-14 that the green background yielded a slightly better probability of acquisition than the brown background.

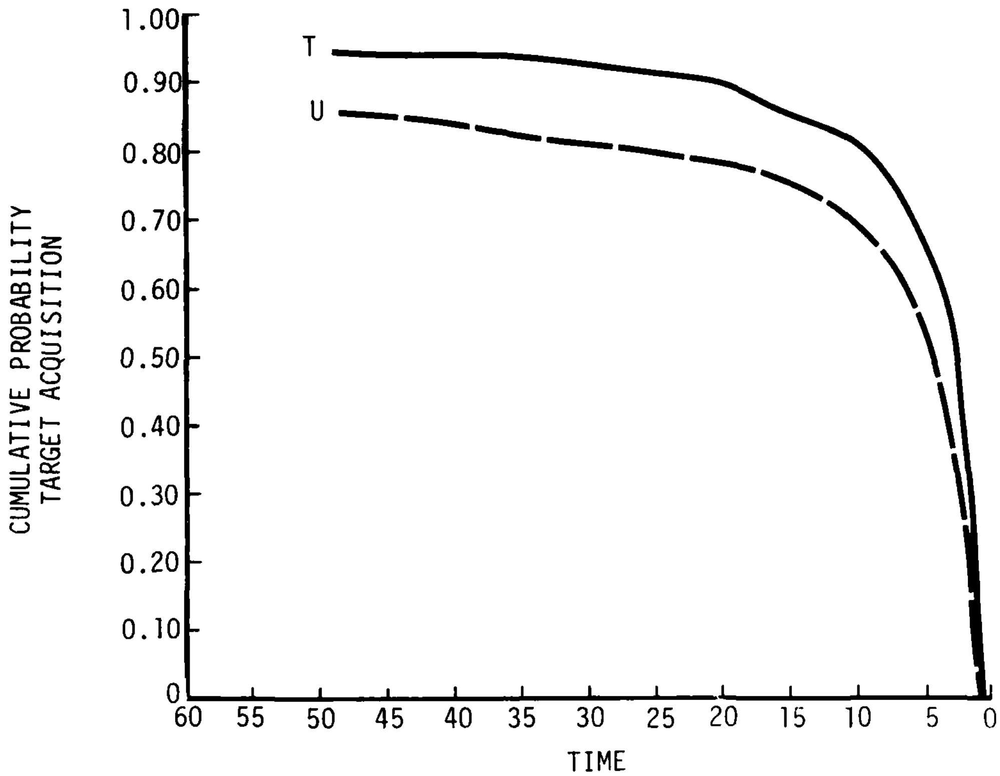


Figure 7-16. Effect of Observer Training, Rotary Wing

The trained Observer, either fixed wing or helicopter, was also more efficient in finding targets in conditions of clutter, the most significant of variables. Table 7-VI presents the relative efficiency of the two groups as a function of clutter conditions. In the low clutter case the two groups are nearly equal (rates approximately 1.0). In medium and high clutter the trained Observers were more efficient in acquiring targets.

TABLE 7-VI. RATIO OF TARGET ACQUISITIONS EFFICIENCIES, TRAINED TO UNTRAINED OBSERVERS

Clutter	Fixed Wing	Helicopter	Overall
Low	1.06	1.005	1.06
Medium	1.40	1.17	1.23
High	1.25	1.26	1.25

8.0 OVERALL CONCLUSIONS AND RECOMMENDATIONS

The conclusions in this section are addressed both to the overall objectives of the SEEKVAL program and to the specific objectives of the IB1 experiment. The recommendations are offered for the consideration of future experimenters in the field of target acquisition.

8.1 Objective of the SEEKVAL Program

The overall objective of the SEEKVAL program, as stated in WSEG Report 196, is to evaluate alternative systems and techniques for acquiring targets in combat air support missions. It is concluded that this objective was served in the IB1 Experiment in that four modes of target acquisition were evaluated in the fixed wing sub-experiments and three modes were evaluated in the rotary wing sub-experiments.

The evaluations were limited to search modes where the use of direct visual search was always possible and thus excluded direct application to those systems in which the Observer is constrained to the use of a search aid. Since, for the near future at least, most target acquisition hardware will use direct visual search as an integral part of the target acquisition process, the IB1 experiment did address the immediate needs of target acquisition research.

8.2 Objectives of the IB1 Experiment

The source document for the design and conduct of the IB1 experiment, WSEG Report 230 states that, "The primary objective of the Aided Visual Terrain Table Experiments is to determine the relative effectiveness of visual search aided by an acquisition sensor as compared with direct visual search alone. The experiments should also demonstrate the utility of terrain tables as tools for the continuing evaluation of alternative target acquisition systems and techniques." The success of the experiment in meeting this objective is assessed as follows:

1 Determination of Relative Effectiveness of Search Methods

This objective was accomplished. The interpretation of the results in terms of quantitative measures is addressed in Section 7.1. Although the search methods did not display a consistent direction of influence, the visual aids showed some benefit at the longer ranges (beyond 4500 meters) and possibly could be helpful for rotary wing testing at longer ranges than established for sub-experiments 4 and 5. However, any visual aids utilized must be flexible enough so that direct vision can be readily substituted when appropriate. Aids must not introduce a task complexity that negates their operational effectiveness. The helmet-sight-controlled, variable-field-of-view sensor used in the fixed wing experiments appeared to meet these criteria.

2 Demonstration of Terrain Table Utility

Any final judgment as to the effectiveness of this experiment in meeting this objective must await the results of the SEEKVAL IE Experiment (flight tests at Fort Lewis, Washington) which is specifically designed to determine the validity of the IB1 and IB2 Experiments. It can be stated at this time, however, that the IB1 results do correlate well with other terrain table experiments and flight tests.

a Fixed Wing

The SEEKVAL IA1 experiments conducted at the AMRL facility used a small (1000:1 scale) terrain table. In the first experiment conducted there, the Observer flew by the target at 3500 feet altitude and 300 knots (simulated) rather than over it. The total rate of acquisition for that experiment, based on 108 total trials, was 40 percent. This is almost the same as the overall acquisition rate achieved in the fixed wing sub-experiments of the IB1 experiment (see Figure 8-1). In a series of fixed wing target acquisition studies conducted in the Martin Marietta Optical Laboratory at 600:1 scale for the Office of Naval Research, the overall rate of acquisition was 43 percent (Fowler and Jones, 1972).[1] Finally, in the recent summary of target acquisition research, the reported typical field test mean range of acquisition of three vehicles under conditions of clear (10 nautical mile) visibility was 4250 meters (Jones et al., 1974). Typical mean range of acquisition of three vehicles from other terrain table experiments was similarly reported as 4570 meters. Combining all three IB1 fixed wing experiments using three tanks, the mean range was 4878 meters. Thus, it can be concluded that the 800:1 scale fixed wing simulation was valid, the results typify those of other simulations, and the data should be directly correlatable with field tests.

b Rotary Wing

The helicopter simulations conducted at 200:1 scale and at much shorter initial ranges, represented a different set of Observer conditions and tasks. The IA1 tests included one helicopter simulation at 1000:1 scale. In IA1 the helicopter range varied from 2050 to 2350 meters

---

[1] F. D. Fowler and D. B. Jones, Target Acquisition Studies (Final Report), Martin Marietta, Orlando, Florida, OR 11,901, April 1972.

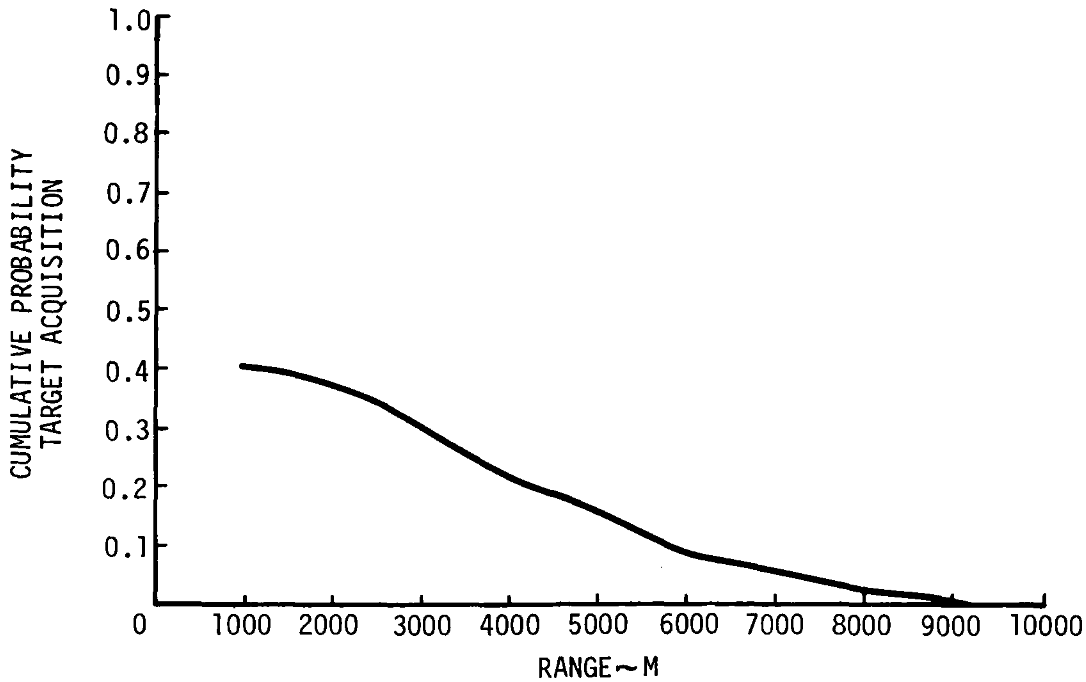


Figure 8-1. Totals for Sub-Experiments 1, 2, and 3, Fixed Wing

at various altitudes from 583 to 2000 feet. The number of tank targets - 1, 3 or 9 - was a primary variable. Since IB1 sub-experiments 4 and 5 used only three targets, we can compare the three target case only. The rate of acquisition in the IA1 helicopter series for three targets was 56 percent (20 correct acquisitions in 36 attempts). In sub-experiments 4 and 5 of the IB1 experiment, the rate of acquisition was 88 percent (Figure 8-2). No other helicopter simulations using terrain tables are reported in the literature. In a helicopter field test conducted at Naval Weapons Center, China Lake, at altitudes below 800 feet, the overall rate of acquisition was 76 percent,[1] with the ranges of acquisition tending to be less than 2000 meters. Other helicopter field tests of target

[1] P. H. Amsendson, A. Schlarta and R. Sorenson. Helicopter Operational Test Target Acquisition, Naval Weapons Center, China Lake, California, NWC TP 5591, January 1974.

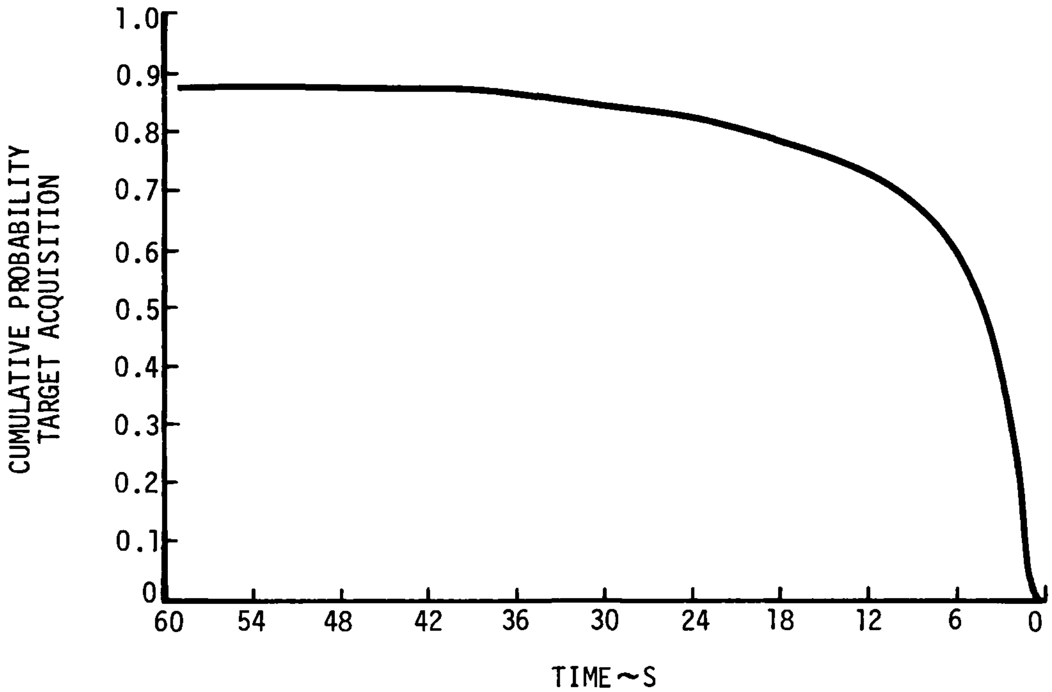


Figure 8-2. Totals for Sub-Experiments 4 and 5, Rotary Wing

acquisition have been conducted by the U.S. Army (Moler 1962;[2] Monty, Hicks and Moler, 1966;[3] Bryson 1972;[4] Barnes 1974[5]). In general these field tests emphasized low level and nap of the earth flying; they reported much lower rates of acquisition (approximately 40 to 60 percent) at shorter ranges than were the case in IB1. For direct view experiments, it is difficult to simulate low level or nap of the earth flying with terrain tables.

[2] C. G. Moler, Helicopter Armament Program, Air-to-Ground Target Detection and Identification. Human Engineering Laboratory, Aberdeen Proving Ground, Md. TM 1-62, January 1962.

[3] R. A. Monty, S. A. Hicks and C. G. Moler. Acquiring and Relocating Targets from a Helicopter: A Preliminary Investigation, U.S. Army Human Engineering Laboratory, Aberdeen Proving Ground, Md., TM 2-66, January 1966.

[4] M. R. Bryson, Air-to-Ground and Ground-to-Air Detection Experiments. In D. B. Jones (Ed.) ONR Target Acquisition Symposium, November 1972. Martin Marietta Corp. Orlando, Florida, January 1973.

[5] J. A. Barnes, Human Engineering Laboratory Helicopter Acquisition Test (HELHAT). U.S. Army Human Engineering Laboratory, Aberdeen Proving Ground, Md. TM 20-79, September 1974.

8.3 Recommendations

The results of this experiment provide some measure of the variables affecting target acquisition, as well as pose several intriguing questions. The following recommendations for additional research have been developed from the results of the experiment.

1 The terrain table simulation should be validated by field tests conducted under similar conditions and with similar key experimental variables. (Note: the design for Experiment IE is, within the constraints of budget, time, and aircraft availability, well suited to comply with this recommendation.)

2 The search methods should be evaluated under conditions where the appropriate number of Observers is constrained to use the visual aids.

3 The definition of clutter should be standardized to include not only size, shape, and number, but contrast relative to the target.

4 The effect of clutter items in the 10 to 20, 20 to 60, and greater than 60 similar objects in the target area should be evaluated.

5 The nature of the effects of contrast in target acquisition situations should be further evaluated. The effects of target-to-background contrasts from -0.10 to -0.40 should be evaluated and a more precise mathematical description developed.

6 The effects of target/background coloration and contrast should be further evaluated.

7 The solar simulation technique should be validated by using the terrain table in natural sunlight as well as by correlation with field test data.

8 At least two more sun elevations, below 20 degrees and above 40 degrees, should be tested. A mathematical description of sun elevation effects should then be developed.

9 The relative effect of target formations and deployment more typical of those tactically expected should be evaluated.

10 The zero target case should be experimentally evaluated using more precise controls on observer behavior and better measures of that behavior.

11 The effects of repeated runs over the same target area should be tested and a reasonable description of the effects of learning on target acquisition be developed.

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APPENDIX A

PROJECT MANAGEMENT, ORGANIZATION, AND RESPONSIBILITIES

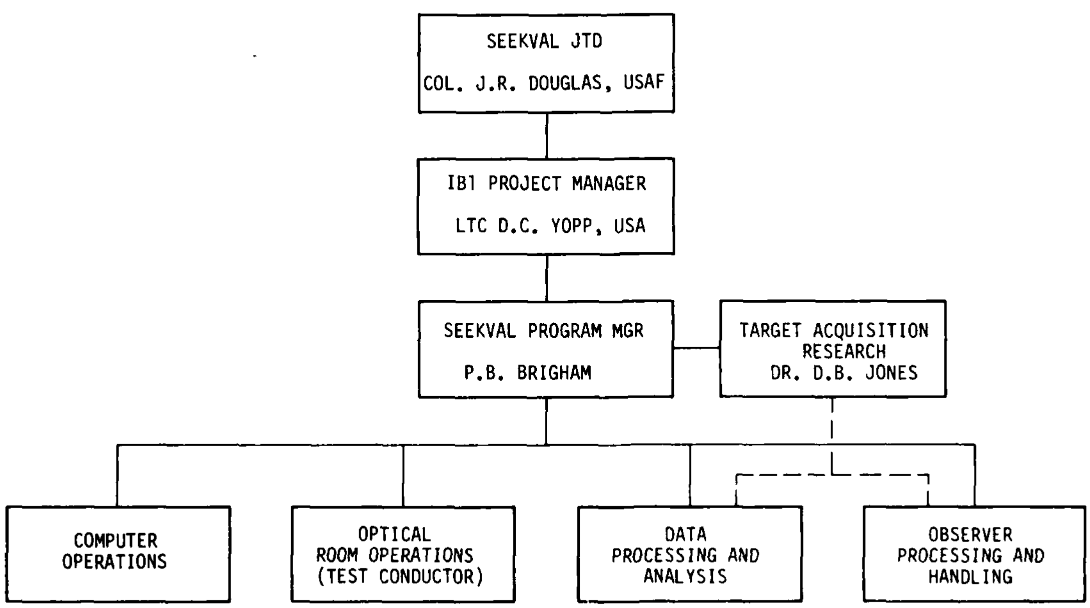
1.0 Management

The SEEKVAL Joint Test Force (JTF) was responsible for the overall management of the Aided Visual Terrain Table Experiment. The JTF Director managed and directed the test within the limits established by DDR&E. The Project Manager was responsible for on-site management of the experiment. The SEEKVAL JTF coordinated services and commands participating in the experiment.

On June 28, 1974, Martin Marietta Corporation, Orlando, Florida, was placed under contract to conduct Experiment IB1. The contract called for laboratory preparation, conduct of the experiment, and analysis of the results. The Project Plan was published by the JTF in October 1974. The experiment started on December 9, 1974, and concluded on March 6, 1975.

2.0 Organization

The Martin Marietta SEEKVAL team under the control of the SEEKVAL Joint Test Director (JTD), was organized as shown.



3.0 Responsibilities

Responsibilities of the various organizations involved in SEEKVAL Experiment IB1 were as follows:

1. The Joint Test Director

   Provide overall management and financial support

2. The Department of the Navy

   a. Provide 48 fixed wing aviators/Observers as required in the project test plan

   b. Provide additional technical and materiel support as required.

3. The Department of the Army

   a. Provide a Project Manager to plan and conduct the experiment

   b. Provide 106 rotary wing aviators/Observers as required

   c. Provide additional technical and materiel support as required.

4. The Department of the Air Force

   a. Provide 66 fixed wing aviators/Observers as required

   b. Provide additional technical and materiel support as required.

5. The Commandant of the Marine Corps

   a. Provide 68 (50 rotary wing/18 fixed wing) aviators/ Observers as required

   b. Provide additional technical and materiel support as required.

6. The Martin Marietta Corporation

   a. Provide and configure a suitable terrain table and solar simulator

   b. Collect, organize, and analyze the data and publish the final report under approval by the JTD

c Provide the necessary technical support required to conduct the experiment

d Provide additional technical and materiel support as contracted and delineated in the Statement of Work

e Provide 288 suitable subjects to act as Observers as required in the conduct of the experiments.

APPENDIX B

OPTICAL LABORATORY SETUP

Martin Marietta conducted SEEKVAL Experiment IB1 in the Optical Laboratory of the Guidance Development Center. The physical, electrical, and computational elements of the experimental setup are described in this appendix.

1.0 GDC Description

a. General Description

Electro-optical, IR, and laser systems are evaluated using a 40 x 40 foot movable terrain model. The terrain features movable targets, changeable scale, and full side curtains to simulate horizons. The terrain can be used either indoors or out, depending on the weather and the conditions to be simulated. Equipment under test is normally mounted in a gimbaled flight table capable of simulating yaw, pitch, and roll movements. The table, in turn, is mounted to a transport that is free to move both laterally and vertically. For SEEKVAL Experiment IB1, the habitat (cockpit) was mounted in place of the gimbal. Simulation parameters pertinent to SEEKVAL at 800:1 and 200:1 scales are:

	800:1	200:1
Slant range	15 km	3.75 km
Altitude	16,000 ft	4,000 ft
Lateral range	32,000 ft	8,000 ft
Horizontal velocity	to 8,000 ft/sec	to 2,000 ft/sec
Vertical velocity	to 4,800 ft/sec	to 1,200 ft/sec
Lateral velocity	to 3,200 ft/sec	to 800 ft/sec

b. Illumination and Contract

The optical room lighting is a combination of low ripple (1 percent maximum) and fluorescent lighting. The low ripple system is provided by 750 watt incandescent lamps giving approximately 200 foot-candles 36 inches above the floor. These lamps are used with the fluorescents to simulate a very bright sunlight day, or alone if the sensor is sensitive to 60 cycle flicker from the fluorescent system. The fluorescent system provides 500 foot-candles and may be reduced by increments of 50 foot-candles.

With this type of lighting, a wide variety of illumination profiles may be generated. The desired illumination levels are achieved by making measurements with a foot-candle meter at various fixed points in the laboratory while adjusting the lighting controls.

Target contrast on the terrain model is determined by photometering the target and its background from the position of the test sensing element. The target contrast is then computed from the difference in luminance values of the target and its background by the formula:

$$C = \frac{T - B}{B}$$

where:

C = contrast

B = background brightness in foot lamberts

T = target brightness in foot lamberts

c. Transport Mechanisms

1) Longitudinal Transport Mechanism

The 3-D terrain model is mounted on 15 trucks, the five central trucks with compound bearings provide lateral guidance in addition to vertical support. The trucks allow longitudinal translation of the assembly on three tracks. The characteristics of the terrain model longitudinal drive assembly are listed below.

Displacement	± 80 feet plus 10 feet on either end for acceleration
Velocity	Accuracy at min ± 5 percent at 0.1 ft/s Accuracy at max ± 2 percent at 10 ft/s
Acceleration	± 8.0 ft/s^2
Positioning	Accuracy ± 1.0 inch Repeatability 0.62 inch max (over any 4 ft span)
Small signal amplitude	0.28 ft/s
Small signal frequency response	3.0 cps
Grain margin	9 dB
Transient response	10 percent overshoot
Settling time	1.5 sec for maximum step input
Weight of longitudinal drive system	22,000 lbs, static and rolling friction less than 250 lbs

The 3-D terrain model is mechanized to simulate the longitudinal movement of the vehicle in flight and, therefore, accounts for one degree of freedom.

2) Vertical and Lateral Transport Mechanisms

The remaining two degrees of translational freedom to simulate vertical and lateral movement of the vehicle are provided by a laterally translating carriage and a horizontal beam. The carriage is attached to a horizontal beam which is free to move vertically between two supporting columns. The operating characteristics of the lateral and vertical drive systems are listed below.

Lateral and Vertical Drive Characteristics

	Lateral	Vertical
Displacement	38 ft	25 ft 7 in
Velocity		
Accuracy at minimum	4.8 percent at 0.004	4.8 percent at 0.006 ft/s
Accuracy at maximum	1.8 percent at 4.0 ft/s	1.8 percent at 6.0 ft/s
Accelerations	2.7 ft/s^2	6.0 ft/s^2
Accuracy	$\pm$1.0 in.	$\pm$1.0 in.
Repeatability (over any 4 ft span)	0.062 in. max	0.062 in. max
Small signal amplitude	0.1 ft/s	0.25 ft/s
Small signal frequency response	3.0 cps	3.0 cps

Gain margin of the servo system is approximately 9 dB and the transient response of the system is limited to 10 percent overshoot.

d. Computer Laboratory

The GDC computers (Figure B-1) mathematically implement aerodynamics, kinematics, and autopilot. The computer laboratory is essentially the central control room where all data is normally gathered. The computers comprise the elements listed below.

GDC Hybrid Computer Complement

Digital Computers

Sigma 5	
Memory Size	32k words
Word length	32 bits
Memory cycle times	1.0 μs
Arithmetic	Fixed point and floating point

Analog Computers (231R's and 231R-V's)	
Number of consoles	6
Total number of amplifiers	1320
Quarter-square multipliers	252
Resolvers	12
Potentiometers	960
Function generators	59

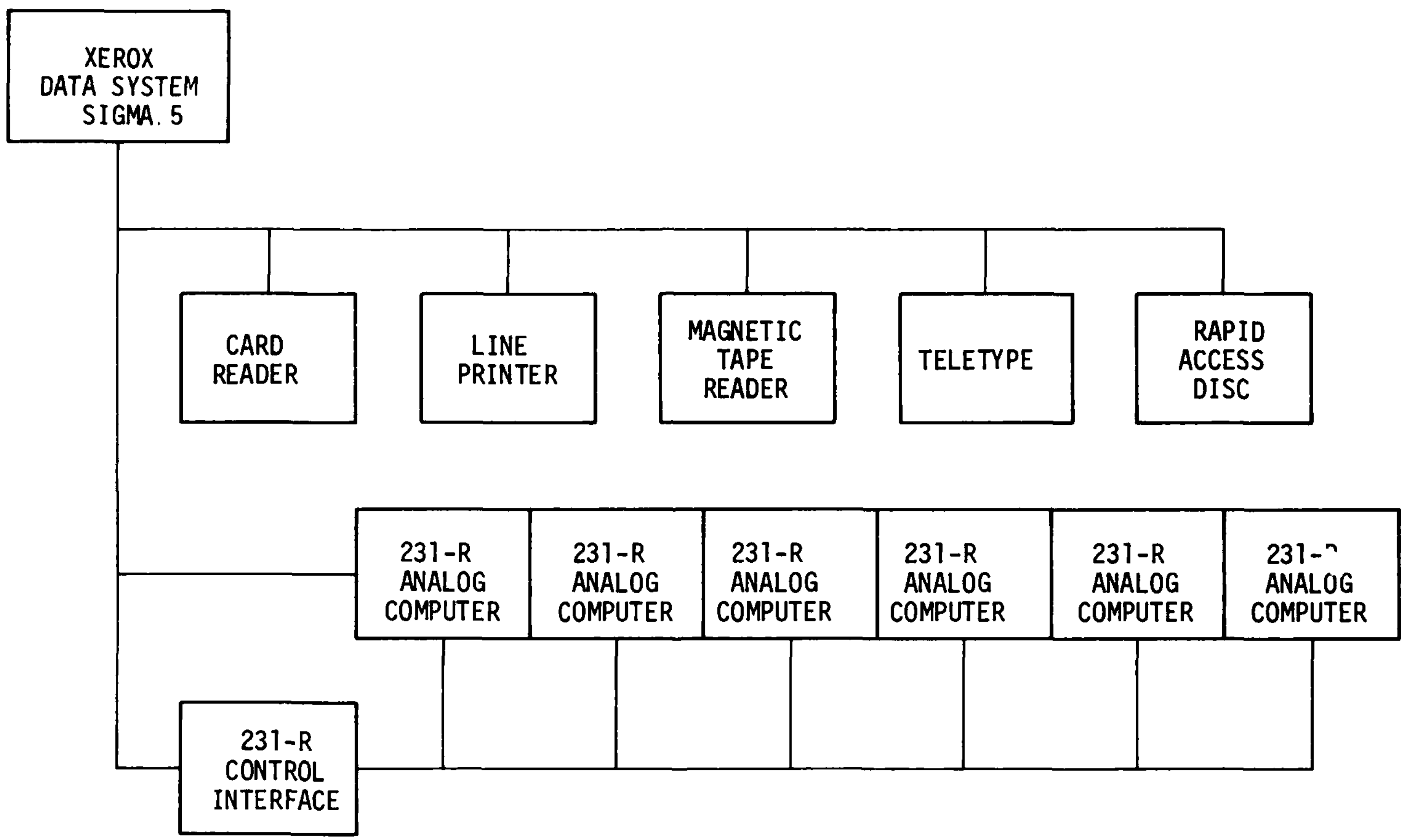


Figure B-1. GDC Computer Configuration

Hybrid Interferace	
(digital computers/231R-V)	
Multiplier and Digital to analog converts	56
Analog to digital converter channels	32
Number of servo pots	450
Peripheral devices - Sigma 5	
Card reader	400 card/min
Mag tapes	75 sec 200/556/800 bits/inch
Line printer	600 lines/min 132 char/line
Disk storage	3.0 Mbytes

The operating system software for the hybrid computer system is as follows:

Operating System Software

Xerox Data Systems supplied software
- Real-time batch monitor
- MACRO assembler
- FORTRAN compiler
- Loader
- RAD Editor
- Math Library
- Diagnostics

Software written by Martin Marietta Aerospace
- On-line debug (CASPRE)
- Functional table processor
- Analog setup

Hybrid run-time Library

Set pots	Convert ADC
Real digital voltmeter	Set control lines
Select address	Read sense lines
Select mode	Read data input register
Set DAC's	Load data output register

e. Data Recording

In addition to the digital computer recording device, the GDC has six 8-channel oscillograph recorders, oscilloscopes, and television monitors available for real-time evaluation. A video tape recorder is available to record the television signal and other tape recorders are available for recording high frequency data. Seventeen-inch X-Y plotters are available for special recording techniques.

f. Control Consoles

Consoles control translational and rotational drive as well as lighting and closed circuit TV. In general, the consoles provide mode of operation (velocity or position and manual or computer control), manage the general signal routing, and provide the outlets for availability of selected parameters to be measured. The control console has provisions for manually introducing a position or rate command for each of the six degrees of freedom, independently or simultaneously.

2.0 SEEKVAL Laboratory Configuration

a. Habitat and Experimenter's Station

1) Structural

The habitat is shown in Figures B-2, B-3, and B-4. It is constructed of 3 inch by 3 inch by 1/8 inch thick steel tube and carries an aircraft seat for the occupant. The Experimenter's station, shown in Figures B-3 and B-4, is of similar construction.

2) Furnishings and Equipment

The TV camera and the gimbaled mirror system were mounted on a common base plate which was positioned above and in front of the habitat occupant's head by an adapter frame as shown in Figure B-2. This placed the gimbaled mirror 6 inches above and 12 inches in front of the Observer's eye. The interior of the habitat had rudder pedals (inoperative), a gimbaled mirror hand controller on the left side, and a TV monitor mounted where the instrument panel would normally be located. Shelves were provided on the back of the habitat to carry electronics associated with the gimbaled mirror and the MOVTAS Helmet Sight.

The Experimenter's station, Figure B-2, carried a CRT terminal and a keyboard that was used by the Experimenter to communicate with the simulation system. The keyboard was in front of the Experimenter while the CRT terminal was about 23 degrees to the left of center and inclined at about 25 degrees. The terminal was located to the left in order that it would not interfere with the Experimenter's view which was directed ahead and to the right.

3) Mounting

Both units were mounted on the horizontal beam of the simulation system as shown in Figures B-3 and B-4. The habitat attached to the existing lateral carriage while the Experimenter's station ran on the beam rails using a set of caster wheels. Both units faced north and the Experimenter's station was on the west side of the habitat. The two were fastened together and moved over the beam by the lateral carriage drive. The seating was arranged such that the Experimenter sat one foot higher than the Observer.

Figure B-2. Observer's Habitat

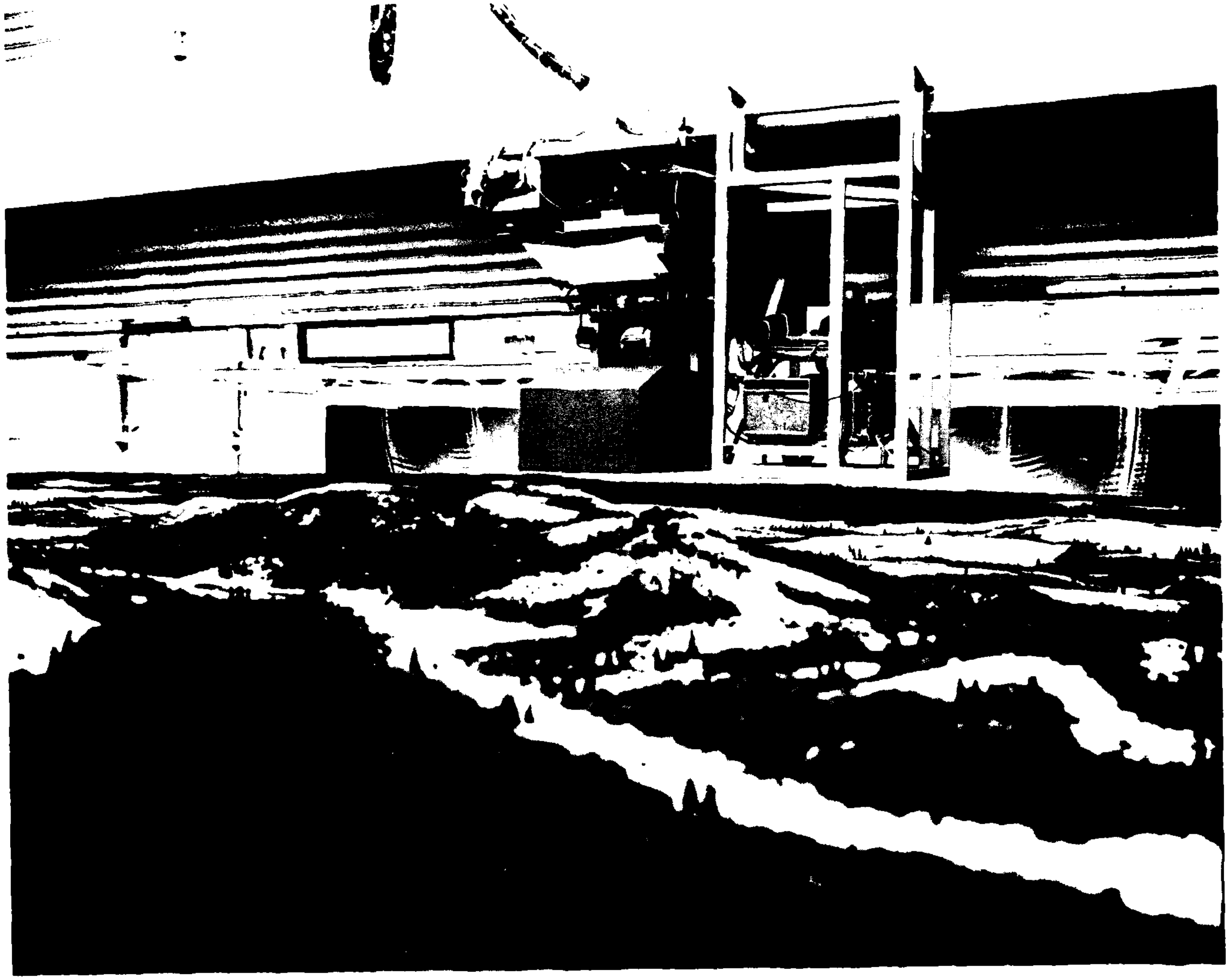


Figure B-3. Habitat and Experimenter's Station

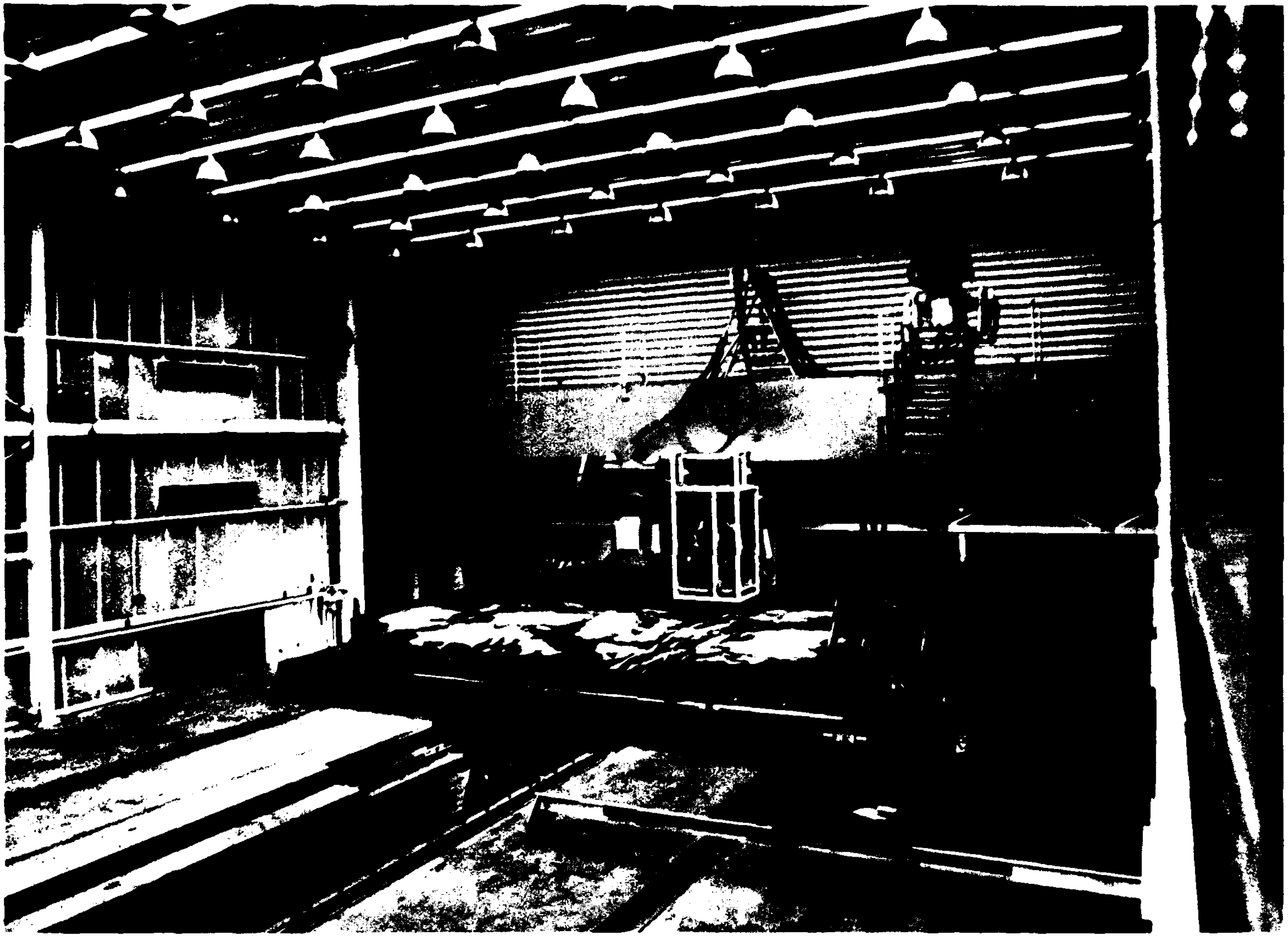


Figure B-4. End of Run With Solar Simulator

4) Sensor/Subject Parallax

The problems of parallax in sub-scale, combined direct and aided view simulations are well known and will not be reiterated here. The position of the sensor gimbaled mirror with respect to the Observer's eye did not produce an appreciable parallax effect at the line of sight depression and azimuth angles normally encountered during the experiments. A truly coaxial line of sight achieved through the use of a combining glass "windscreen" was not considered feasible due to the large combining glass required to accommodate the gimbaled mirror's angular freedom and the effect of the light loss of such a system on the sensor lens f-stop/depth of focus requirement.

5) Out-of-Canopy Masking

The habitat masking angles were plotted using the MOVTAS helmet sight. The Observer scanned from extreme left to extreme right along the upper edges of the habitat sides and nose while azimuth and depression angles were recorded from the analog computer readout system. Figure B-5 shows the masking angles.

b. Illumination

Lighting for SEEKVAL Experiments IB1 was supplied by the existing fluorescent overhead lighting supplemented by the solar simulator lamp. The fixed wing experiments (sub-experiments 1, 2, and 3) used 500 foot-candle overhead lighting only (to simulate an overcast sky) for approximately 25 percent of the runs in sub-experiment 1 and all of 2. The remaining 75 percent of sub-experiment 1 and all of 3 required both solar simulation and overhead lighting such that the solar source provided an intensity at the terrain model surface five times that of the overhead lighting to produce a realistic shadow contrast. These values were 100 foot-candles overhead and 500 foot-candles from the solar simulator. Because of the physical configuration of the optical room, a sun shield structure was provided to prevent actual sunlight from impinging on the model through the open door (the door had to be open to permit the terrain model to pass beneath the habitat).

Rotary wing sub-experiments 4 and 5 used the diffuse overhead lighting only. The level of the overhead lighting was controlled by switch gear controlled from the test conductor's console in the control room.

The light source for the solar simulator (Figure B-3) was a high output xenon arc motion picture projection lamp system. The system selected was the Strong Electric Model X60B lamphouse with a 150 ampere short-arc xenon bulb. The offshelf lamphouse was modified by adding an achromatic lens and a mirror to the existing lamphouse aperture to correct for beam non-uniformity caused by the shadow of the lamp appearing in the far-field beam. The approximately 3-inch lamp aperture ensured holding

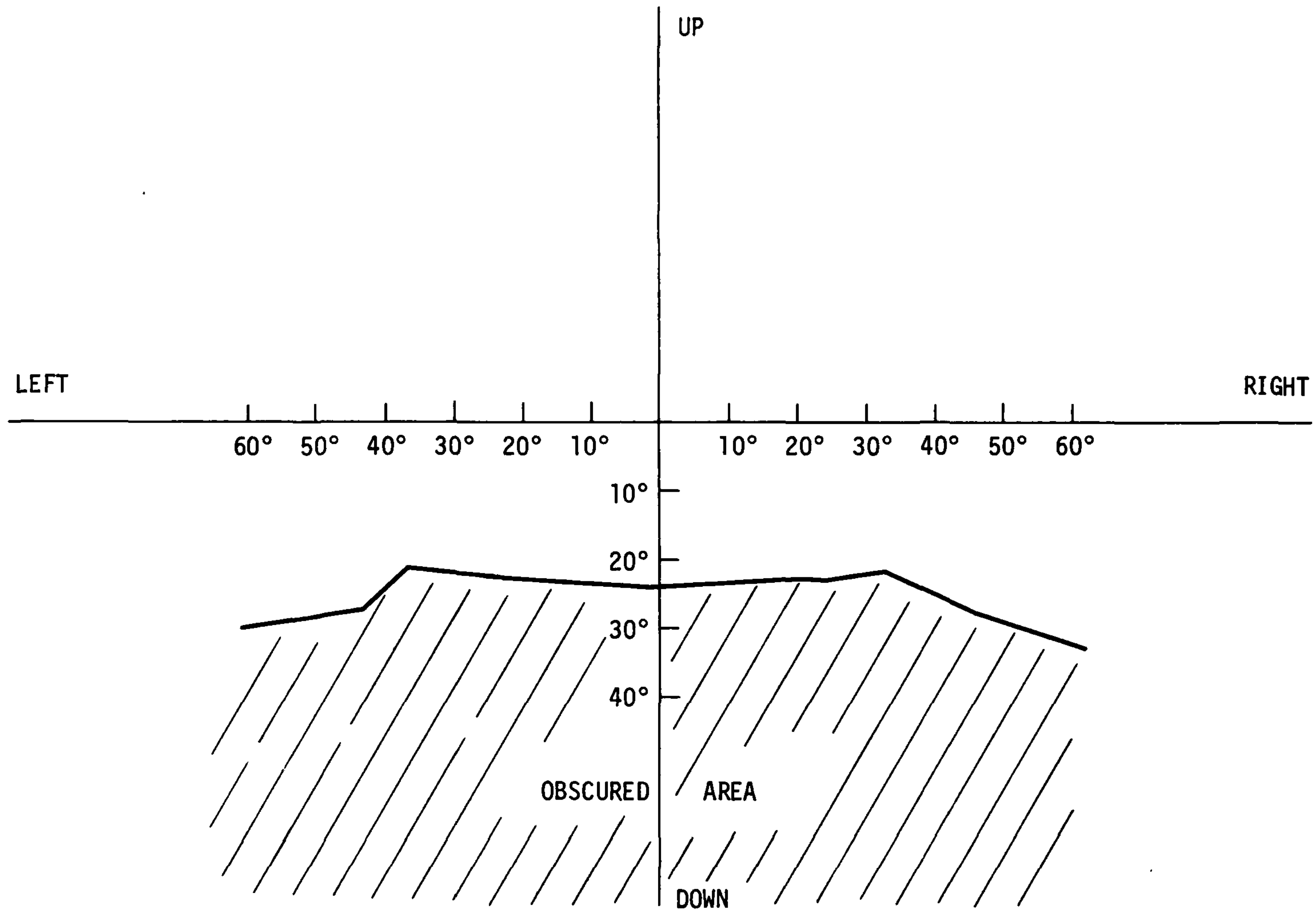


Figure B-5. Habitat Structural Obscuration Angles

shadow edge sharpness to about 1/2 degree at 30 feet from the aperture. Use of the xenon source provided a reasonable match to sunlight for color temperature. The area on the model illuminated by the solar simulator covered a single target area (13.3 x 20 feet) at the planned sun angles and with a 30 foot beam throw.

The solar simulator positioning system was developed around a self-propelled hydraulic lift, a Del Mar Laboratories DPL-20 Model 6B. The lift was moved around the terrain to the appropriate location and then secured to the transporter frame. This provided support against overturning and allowed moving the solar simulator with the terrain model.

The solar simulator lamp was mounted on the end of the boom using a pitch gimbal and tilt/pan mechanism. The lamp power supply was located at the base of the lift, its weight of 385 pounds providing additional protection against overturning.

The 20-foot reach of the boom permitted positioning of the solar simulator for several target areas thus permitting multiple runs without repositioning the lift truck.

c. Gimbaled Sensor and Magnifying Optics

All five experiments made use of a gimbaled television sensor with a variable field of view and autofocus. The rotary wing experiments used, in addition, a magnifying optical device simulating a stabilized optical system.

1) Two-Axis Gimbal

The two-axis gimbal system was located 6 inches above and 12 inches in front of the Observer's eye position. The gimbal was controllable in pitch and yaw. The system employed position and velocity commands and was implemented so that the helmet sight, pantograph sight, or hand controller provided line of sight steering.

The Observer, with the aid of the hand control stick, was able to center the TV field of view on the target. This was done in the rate mode. Figure B-6 shows the gimbaled line of sight field of regard on the terrain model surface as a function of azimuth position but without regard to habitat structural masking. Habitat masking was not a significant factor.

2) TV System

The TV camera system was a Cohu 6100 series camera with an RCA 4532A silicon-diode array camera tube. The lens was an Angineaux motorized zoom and focus system with a 15 to 150 mm focal length capability using a 2X extender, producing a horizontal field of view of from 2.0 to 24 degrees. For SEEKVAL Experiment IB1, the maximum field of view available

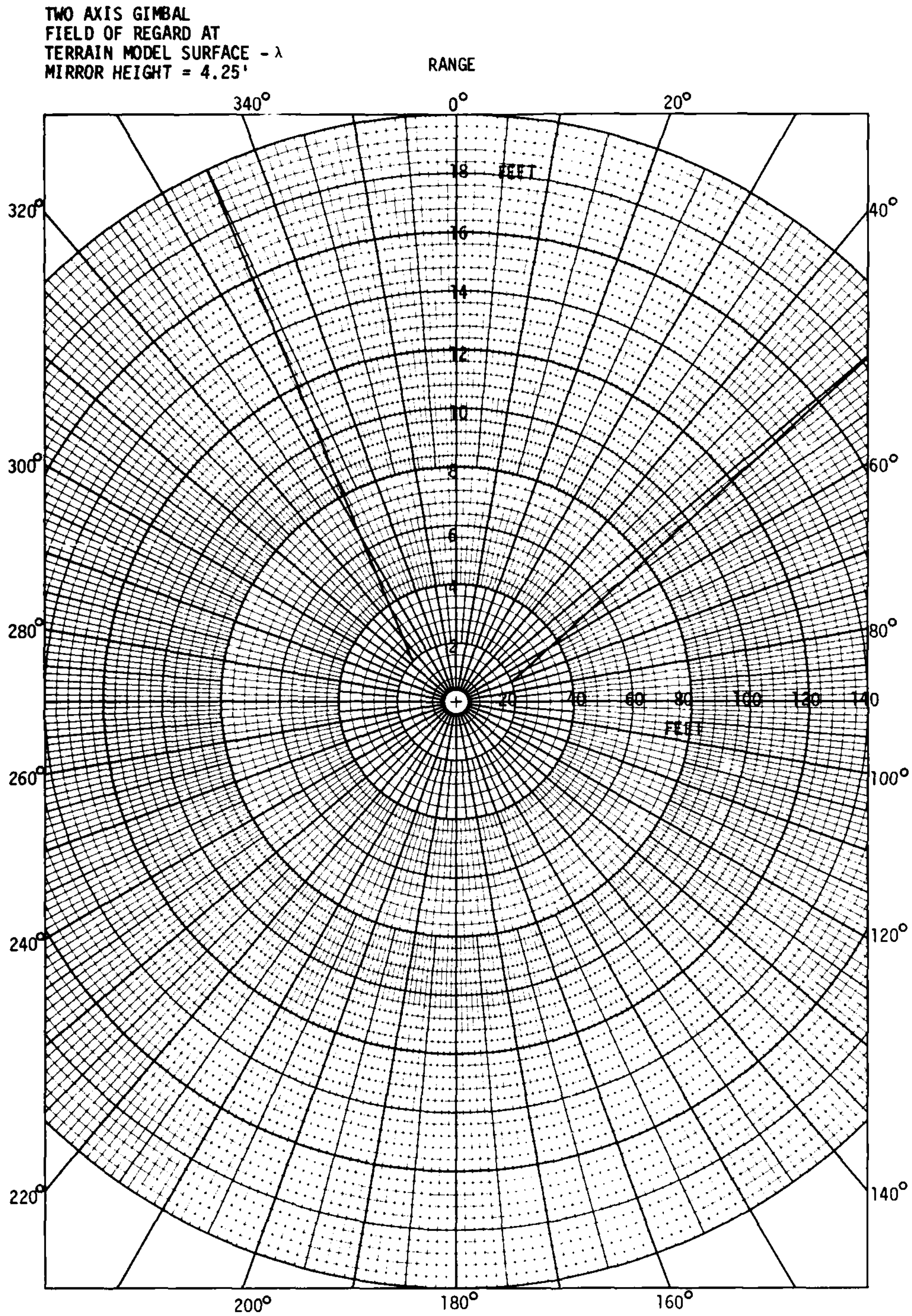


Figure B-6. Gimbaled Line of Sight

to the subject was 8 degrees. Wide and narrow field of view search mode selections were made from the console, and from a potentiometer on the top of the control stick when the subject was to control zoom in the variable field of view search mode. The focus was controlled from the analog computer as a function of gimbal look-angle and position of the terrain model (Figure B-7).

3) Magnifying Optics

To simulate the stabilized magnifying optics required in sub-experiments 4 and 5, a Kalimar K-7001 zoom scope mounted above the pantograph unity power sight was used. This device featured dual eyepieces with a single objective lens to avoid parallax. The zoom feature was not used, but was fixed at 8 power.

d. Displays

Displays utilized in these experiments included the Observer's and the test conductor's television sensor displays, the Experimenter's and test conductor's data displays, and the test conductor's control and status indicators.

1) TV Displays

The Observer's TV was a 9-inch diagonal display, Setchell Carlson model number 10M915, with variable raster size. The display was turned on and off by switching the video on and off with a coaxial relay. The average distance from the TV face to the Observer's eye was 30 inches. The test conductor's monitor was a 5-inch aircraft type; the sensor camera's output was displayed during all runs.

2) CRT Data Display System

Figure B-8 illustrates the components and characteristics of the Xerox BC-200 display system. The CRT/keyboard at the Experimenter's station allowed 2-way communication to the Sigma 5 digital computer. The CRT at the test conductor's station allowed the test conductor to monitor progress and results of each run.

3) Control and Status Indicators

The test conductor's and Experimenters control consoles displayed status of all habitat enabling/disabling controls (TV monitor, zoom, track stick) lighting controls, and lab drive status, positions, and velocities.

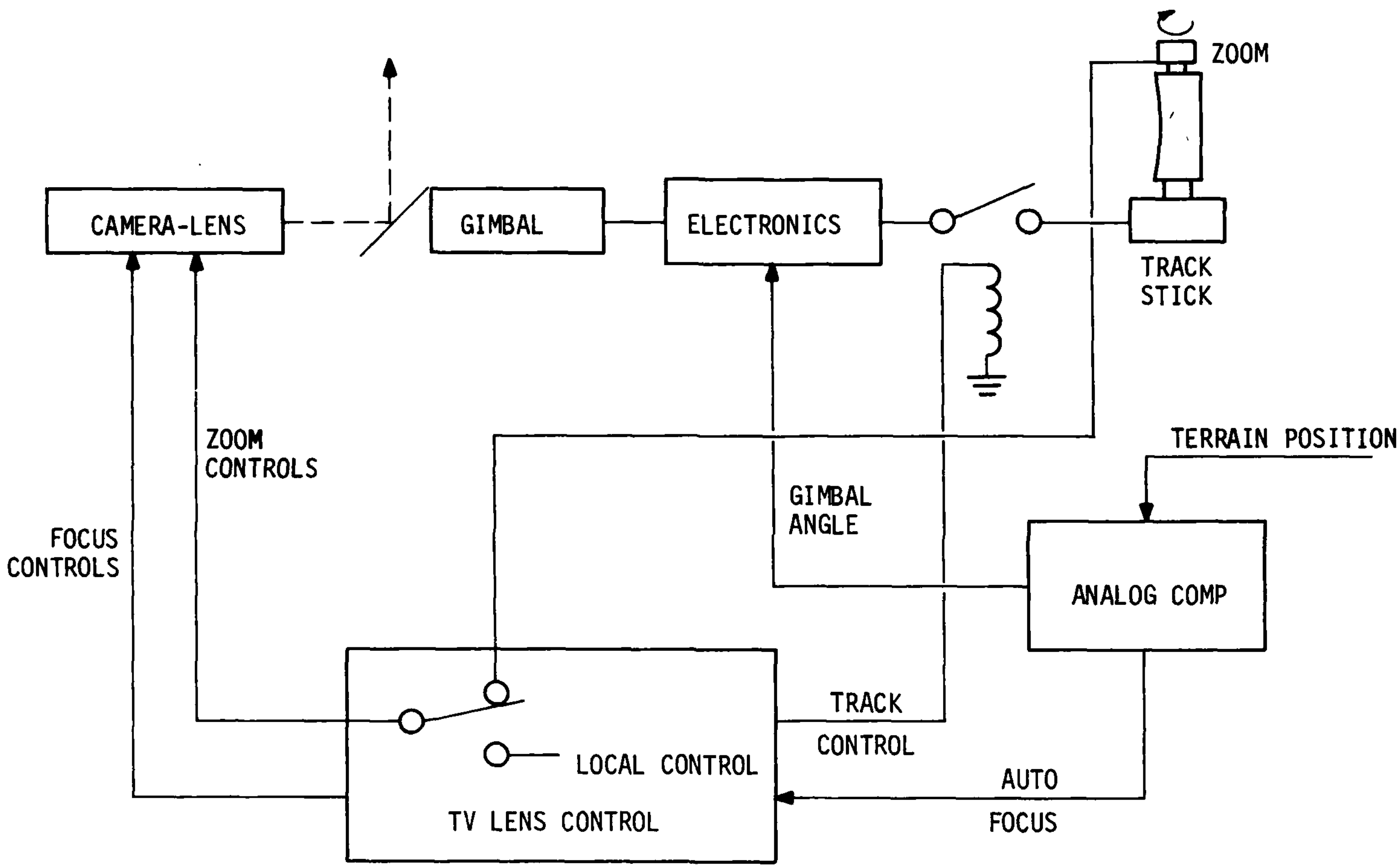


Figure B-7. TV and Gimbal Control

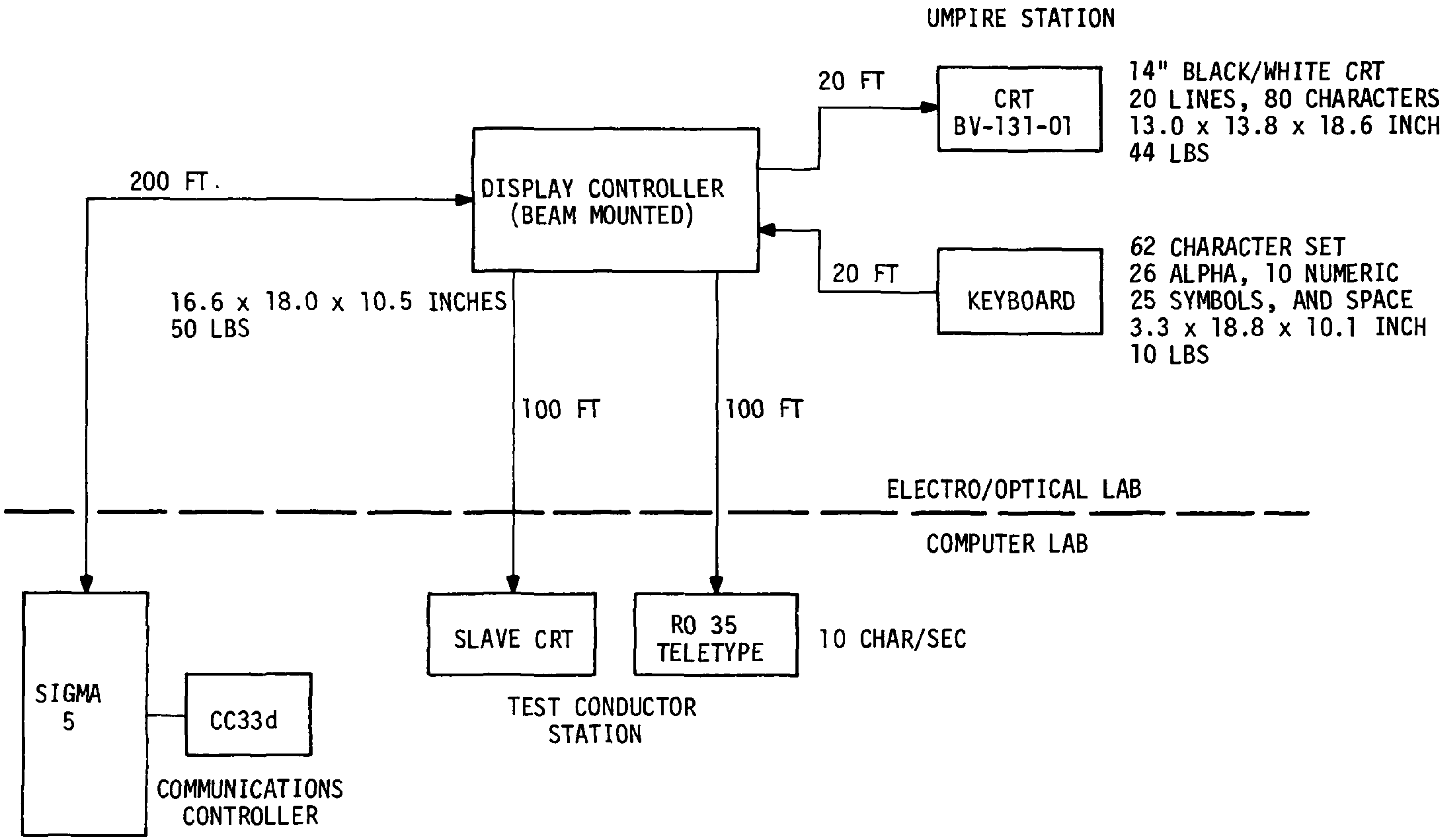


Figure B-8. Hardware Design and Specifications
SEEKVAL BC200 Display System

e. Recording

1) Audio

Two audio channels were used in the SEEKVAL IB1 experiments. As shown in Figure B-9, the system was configured to exclude the Observer from inputs other than the Experimenter's unless the test conductor selected the executive override mode. The Experimenter could switch his microphone output to "subject," "lab," or both. Experimenter/Observer conversations, and audio from the Experimenter's microphone in the "both" position and from test conductor's microphone in the "executive override" position were recorded on audio track 1 of the Sony EV320 recorder. Lab operator/test conductor/Experimenter conversations were recorded on track 2. The Experimenter's headset always received mixed audio from all microphones.

2) Video

The sensor camera in the habitat was operative during all runs. In the direct view runs, the camera was set to its widest field of view and used to record the entire run. For runs where the subject had available wide field of view, narrow field of view, or zoom as an aid to acquisition, the video record provided data on employment of the sensor.

3.0 Terrain Table

3.1 Surface Configuration

The surface was basically an 800:1 representation of a relatively homogeneous terrain with six discrete areas. For ease of discussion, the zones are numbered as shown in Figure B-10, which depicts the model as configured for fixed wing sub-experiments 1, 2, and 3. Zones I and V are duplicates of two of the existing SEEKVAL target zones at Fort Lewis, Washington, Zone I is the Weir Prairie area which lies approximately 22 kilometers southwest of Grey Army Airfield. Zone V is the 13th Division Prairie, about 12 kilometers southeast of the airfield.

Zones II and III are representative of Central Europe area in topography, vegetation, and cultural details, and Zones IV and VI are a general Fort Lewis representation.

Figure B-11 shows the same basic terrain table as it was configured for rotary-wing experiments 4 and 5. The zones, numbered I through IV as shown, are basically the same as the fixed wing zones I, II, IV, and V except that it was necessary to eliminate some Weir Prairie detail to allow a large enough clearing to control clutter in the 200 meter radius required. The east-west dirt road separating the southern zones from the center zones for the fixed-wing configuration was paved for the rotary wing configuration to provide a more pronounced demarcation.

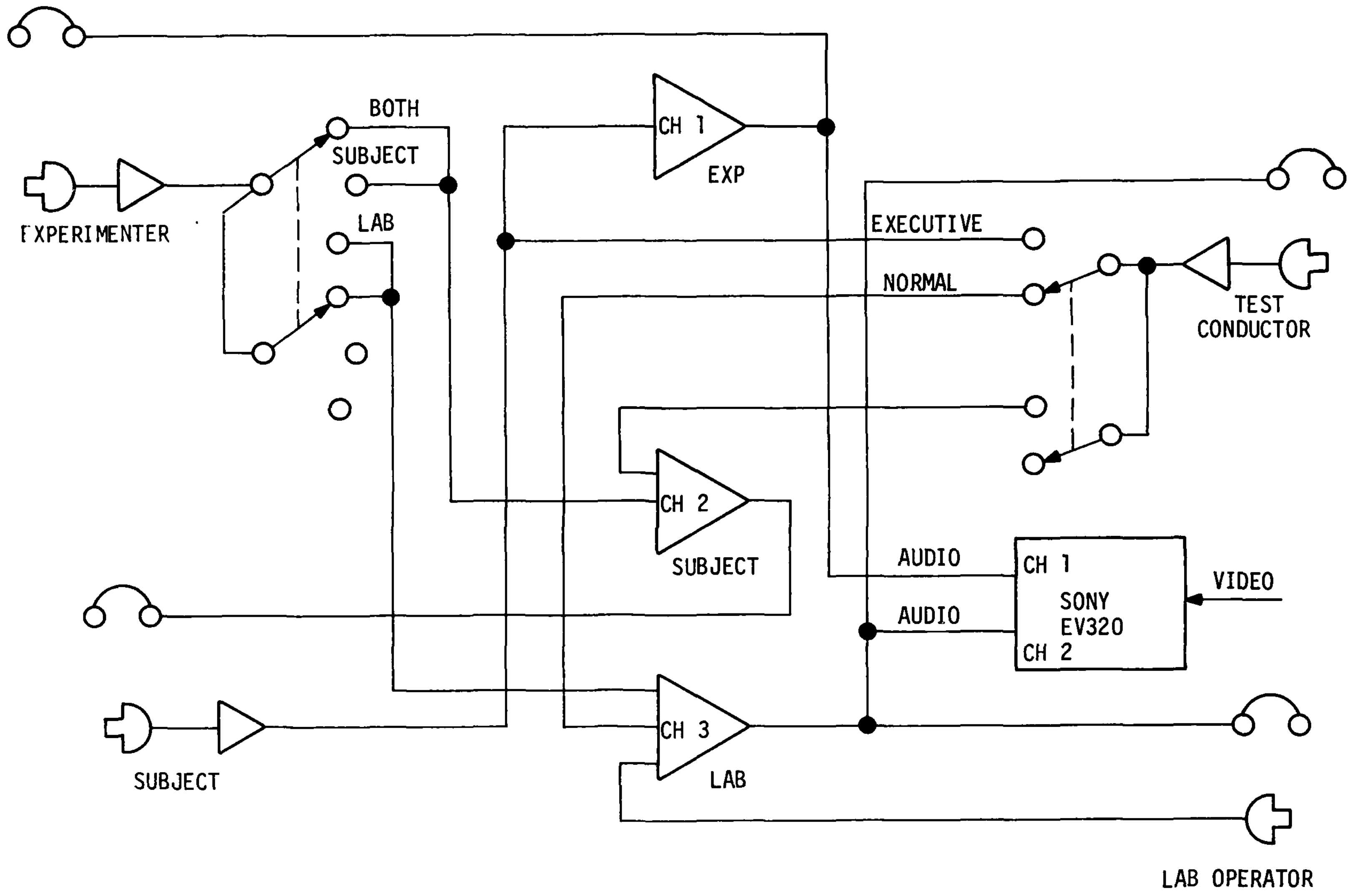


Figure B-9. Laboratory Audio System and Audio/Video Recording System

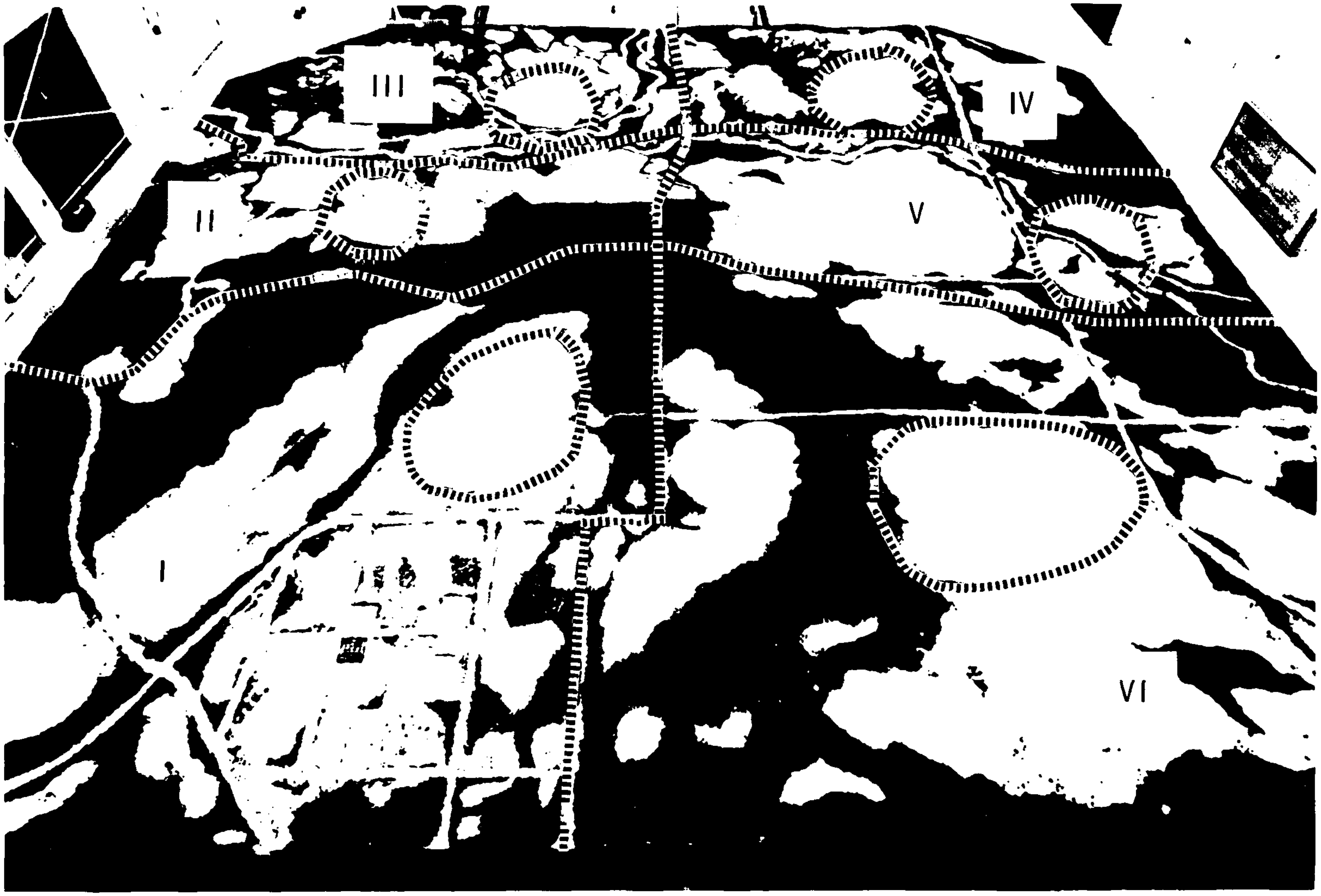


Figure B-10. Terrain Table Zones for Sub-Experiments 1, 2, and 3

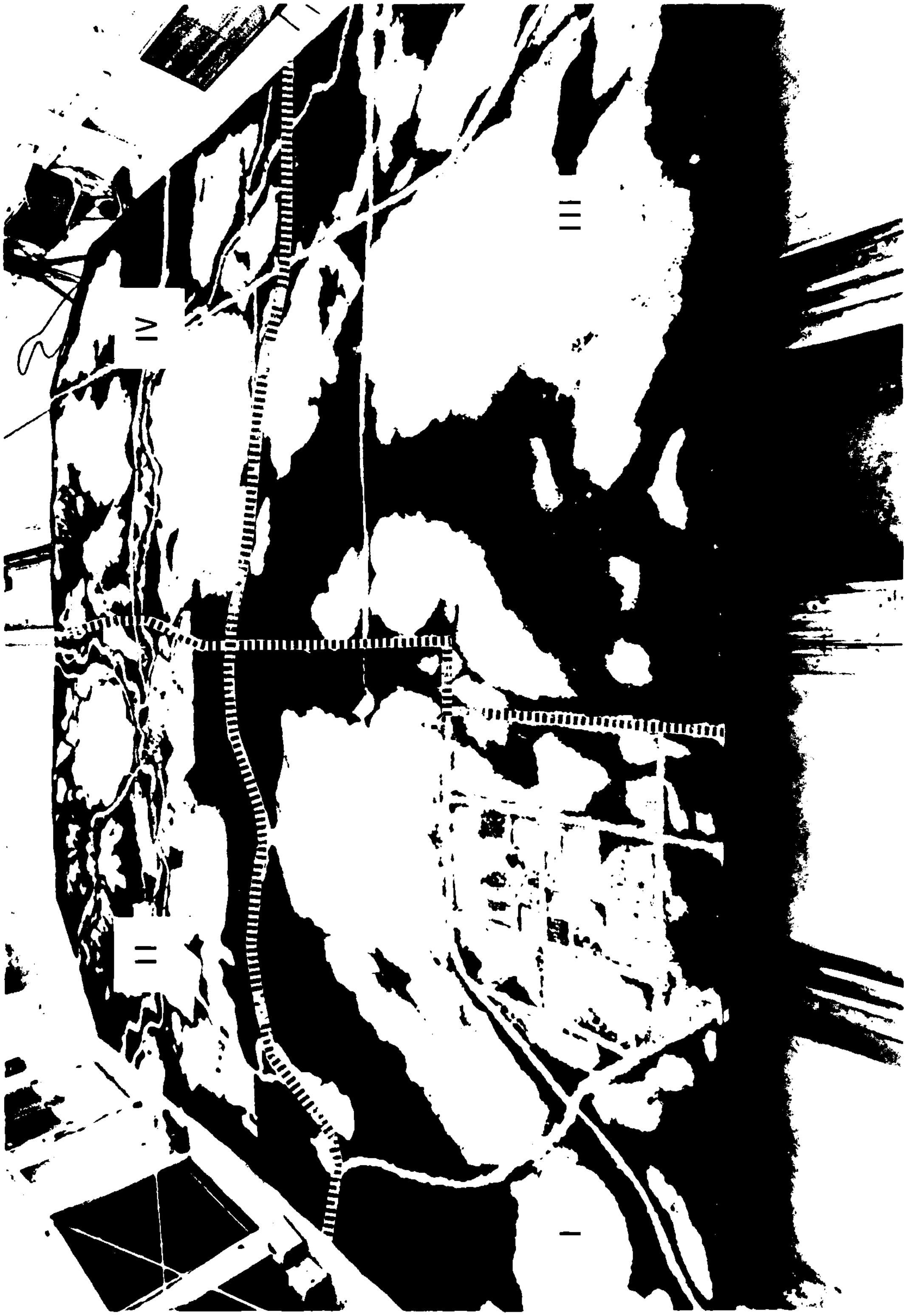


Figure B-11. Terrain Table Zones for Sub-Experiments 4 and 5

3.2 Foliage

The vegetation was primarily coniferous with some random mix of deciduous trees similar to those found at Fort Lewis. Several different types of tree construction were used depending upon density, tree height, and detail required. Clutter elements featured fine detail so as not to detract from the realism in the immediate target area.

3.3 Buildings

Buildings, found primarily in the Central European areas, were of two scales, 800:1 for fixed wing experiments and 200:1 for rotary wing.

3.4 Target Tanks

Tank models representative of the U.S. M-60 were provided in two scales. Figures B-12 through B-19 show examples of the Observer's view and closeup view for both fixed wing and rotary wing experiments (two arrays each). Figures B-20 and B-21 are closeup views of pattern painted (camouflage) targets in different clutter configurations.

3.5 Coloration

An important aspect of the design of these experiments was enabling future validation of the simulation by flying duplicates of some run configurations at Fort Lewis. Since atmospheric effects except color cannot be duplicated in the laboratory, the colors used were idealized (i.e., brighter than life as seen through several thousand feet of atmosphere) in order to permit use of a mathematical model accounting for atmosphere in later comparison of simulation and actual runs. This decision was reached because it would be more difficult later to partially account for atmosphere (edge effects, sun glare, etc.) than to use a complete atmospheric model accounting for all effects, including apparent coloration. The use of bright, highly reflective colors also enhanced the television sensor f-stop/depth of focus mechanization.

4.0 Cockpit Configuration and Search Aids

a. Cockpit

The Observer's cockpit was configured essentially as described in Annex A of SEEKVAL Project Plan IB1. However, certain developments and improvements occurred in the actual implementation of the hardware:

1 Structural channels were installed to simulate rudder pedals, but no simulated aircraft control stick was provided

2 A built-in sheet metal shelf at the Observer's left provided a mounting surface for the track stick and a location for storage of the oblique terrain model photograph.

Figure B-12. Observers View (Fixed Wing)

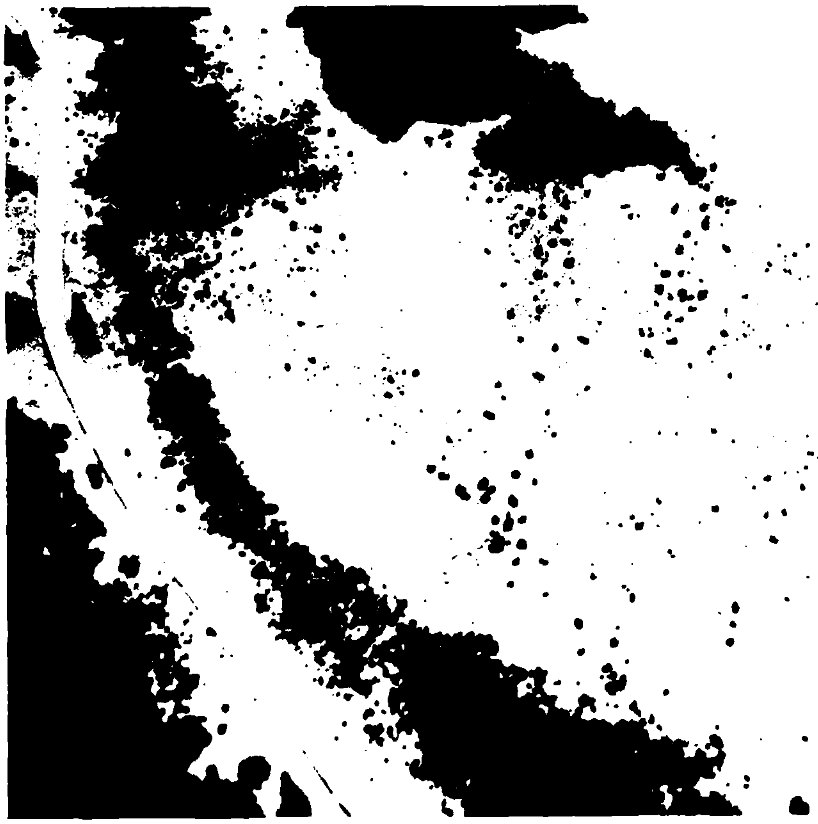


Figure B-13. Close Up (Fixed Wing)

Figure B-14. Observers View (Fixed Wing)

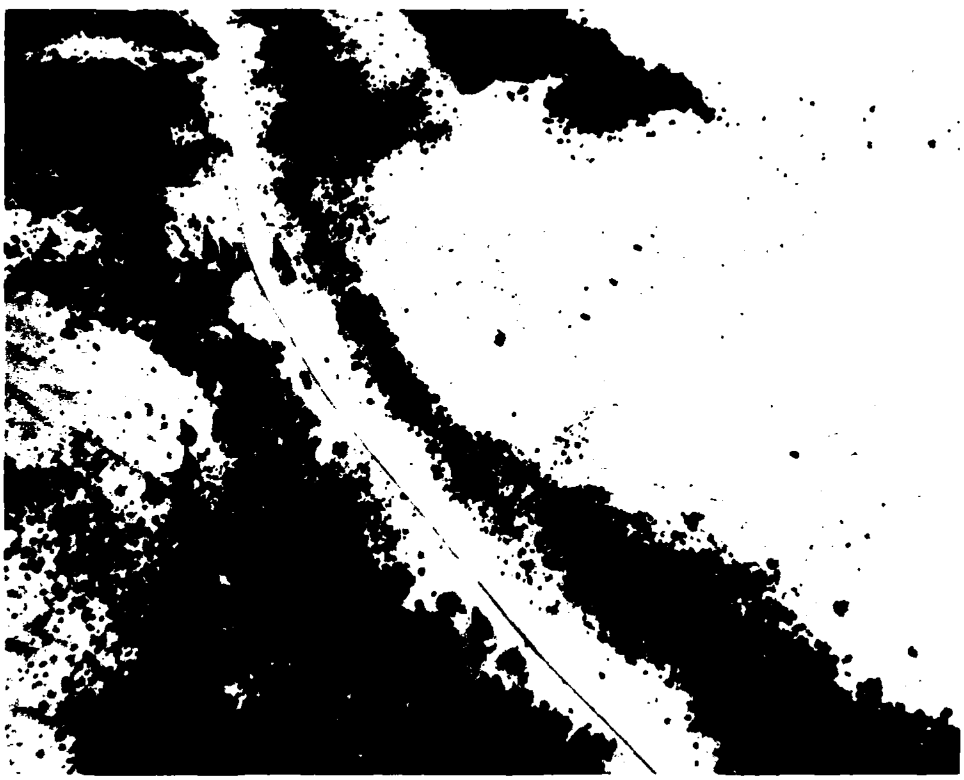


Figure B-15. Close Up (Fixed Wing)

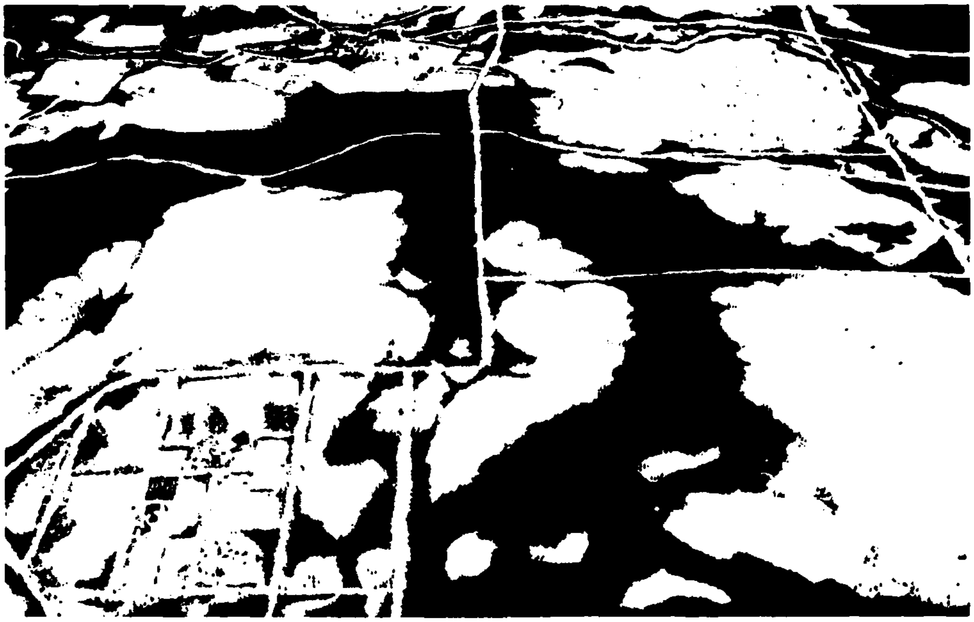


Figure B-16. Observers View (Rotary Wing)

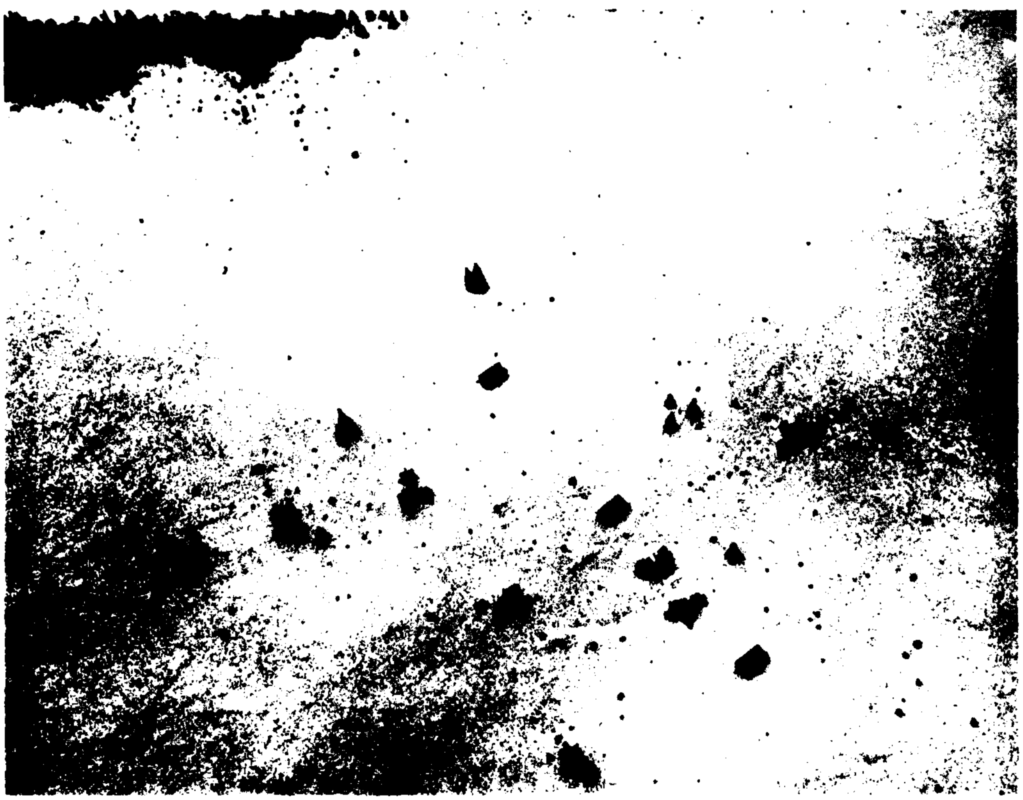


Figure B-17. Close Up (Rotary Wing)

Figure B-18. Observers View (Rotary Wing)

Figure B-19. Close Up (Rotary Wing)

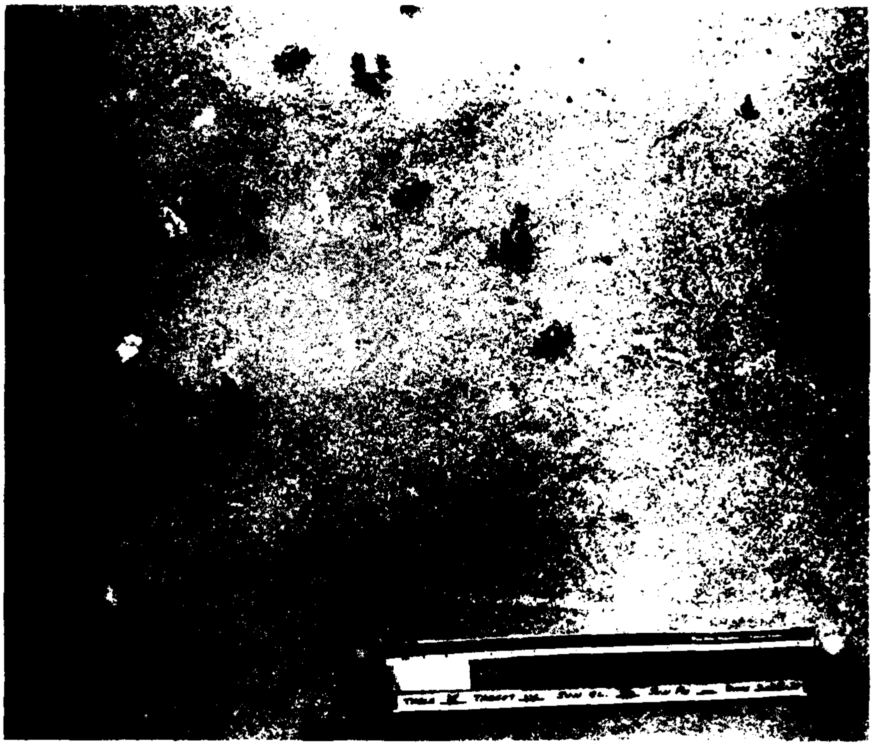


Figure B-20. Close Up Pattern Painted Targets (Rotary Wing)

Figure B-21. Close Up Pattern Painted Targets (Rotary Wing)

3 A doorway and a welded-on step provided access from the right-hand side.

4 Movable sheet metal masking to simulate aircraft canopy masking was found to be unnecessary and was not provided. However, for the rotary wing experiments, a sheet metal shield was added as a vertical extension of the access door to prevent premature over-the-side viewing of zones III and IV when runs were being made in zones I and II.

5 A quick-acting, flip up curtain was made and installed in accordance with Martin Marietta drawing SK 48063. The curtain material was a white opaque plastic. When the run "start" button was pressed by the Experimenter, the curtain flipped up and out of the way revealing the terrain model to the Observer and sensor. The curtain flipped down obscuring the terrain model from the Observer and sensor when the run was terminated by the Observer, the Experimenter, the test conductor, or the analog computer operator. This device was used for the initiation and termination of each run in all experiments.

6 A crewman's seat from an H-34 helicopter, with standard cushions, seat belt, and shoulder harness, was installed.

b. Video System

1 Martin Marietta's two-axis gimballed mirror system (Castfire type) was hard-mounted together with the COHU 6100 series video camera. These units were then attached to the Observer's cockpit structure by means of a very heavy, rigid tubular fitting. This mounting was so developed that the center axis of the gimballed mirror assembly was approximately 6 inches above and 12 inches in front of the Observer's eye. The look angle of the gimballed mirror system was controlled by one of three subsystems: the helmet sight, the pantograph sighting station, or the track stick.

2 For the video camera, continuous focus adjustment was obtained by supplying analog computer data (functions of the gimbal look-angle and the position of the terrain model) through the Automated Lens for Infinite Conjugate Emulation (ALICE) circuitry to the Angineaux motorized zoom and focus system.

3 Video outputs were supplied to the Observer's monitor, to the Experimenter's monitor, and to the audio/video recorder (Sony EV320).

4 During all active TV experiments (both fixed wing and rotary wing) the gimballed mirror angle and hence the look-angle of the video camera was controllable by the Observer using the track stick when track-stick control has been activated. In the fixed wing active TV experiments the alternative look-angle control was the MOVTAS helmet sight, and transfer from one to the other was accomplished by depressing and releasing the correct one of two momentary thumb pushbutton switches on the head of the track stick. In fixed wing active TV experiments, where variable field of view (VF) was called for, the potentiometer on the track stick head was activated so that the Observer could zoom from wide field of view (8 degree FOV, 1:1 magnification) to narrow field of view (2.0 degree FOV, 3.3:1 magnification). In the two other fixed wing active TV modes, wide field (WF) and narrow field (NF), the track stick potentiometer was inoperative and the field was adjusted from the test conductor's station. In rotary wing active TV experiments the alternative look-angle control was the Operator's sighting station, FSH1270-824-4501 (AH-1G "Cobra" gunner's station). Transfer of control from the track stick to the sighting station and back was accomplished by momentarily depressing the upper or lower finger triggers on the control handles of the sighting station. These were two handles (L&R) on the station and either of the two upper triggers shifted control to the track stick while either of the two lower triggers shifted control to the station. For all rotary wing experiments, the shifting buttons on the track stick were inoperative.

c. Stabilized Optics

For the Stabilized Optics (SO) runs in the rotary wing experiments, a stabilized optical device was simulated by a Kalimar Zoom Scope mounted on the top of the sighting station. This installation provided a manually controllable support for the optics; the stabilization feature was not required since there was neither roll, pitch, yaw, nor vibration at the cockpit. The zoom feature of the scope was not used and the magnification was set at 8 power. Prior to each SO run the scope was individually focused for each Observer on targets off the terrain model at the correct range. This scope has two eyepieces similar to standard binoculars, but a single objective lens to eliminate the effects of parrallax due to inter-ocular distance at the 200:1 scale used.

d. Terrain Model Screening for Rotary Wing Experiments

Since the 200:1 scaling of the targets for rotary wing made the subsequent runs easily subject to inadvertent pre-run observation and since the fly-up curtain had to be up for TV equipment operational briefing and for SO focusing, a portable screen (approximately 4 x 8 feet) was placed on an easel in front of the cockpit to preclude pre-run observation. After the flip-up curtain was put down at the start of the run-set, the Experimenter removed the easel and screen; he replaced them at the end of the run-set.

e. Observer's Event Marker Switch (or "Triggering")

In all fixed wing runs and in rotary wing direct view runs, the forefinger trigger on the track stick was the sole means for the Observer to indicate target acquisition. For the video aided (EO) and optically aided (SO) runs of the rotary wing experiments, two thumb pushbuttons located on the control handles of the sighting station were also available to indicate acquisition. In practice, for all of the SO runs and many of the EO runs these were used in lieu of the track stick trigger since the Observer's hands were already on the sighting station handle.

APPENDIX C

PREVIOUS RELATED RESEARCH

This appendix discusses a few previous experiments that are of particular interest to the SEEKVAL program. For a comprehensive review of the target acquisition literature, see Jones, Freitag, and Collyer (1974)[1].

1.0 Target/Background Variables

Some variables associated with the targets and with their background characteristics affect target acquisition. Variables such as size and shape are specifically target characteristics; others, such as clutter, relate to the background; and some (contrast, for example) are associated with both target and background characteristics. Although target features can be varied independently of the background (and vice versa), target acquisition depends on the interaction effect of both target and background variables.

The target/background variables of concern in these experiments are target number, contrast, coloration, and clutter. Others (such as target size and shape) have been the subject of many laboratory studies, simulation experiments, and field trials. Target/background contrast and background clutter have been studied in carefully controlled laboratory experiments. The relatively small amount of flight test data relating these factors to target acquisition reflects the difficulty of controlling and quantifying them under flight test conditions. Fortunately, they can be studied experimentally by high-fidelity simulation techniques.

a. Target/Background Brightness Contrast

Target/background brightness contrast is a way of quantifying the difference in brightness between the target and its immediate background. It is usually defined as:

$$\text{Contrast} = \frac{L_t - L_b}{L_b}$$

where L_t is the brightness of the target and L_b the brightness of the background. Contrast thus defined may be positive or negative according to whether the target is brighter than its background or vice versa. Negative contrasts were used in SEEKVAL Experiment IB1 (i.e., the target was always darker than the background).

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[1] D.B. Jones, M. Freitag, and S.C. Collyer, Air-to-Ground Target Acquisition Source Book: A Review of the Literature. Martin Marietta, OR 12,470, Orlando, Florida, September 1974 (AD B000260L).

In most target acquisition studies, inherent contrast (the target/background contrast measured at the real-world target) is of less significance than apparent contrast (the contrast between target and background measured at the Observer's eye). Apparent contrast results from the absolute at-target contrast as it is degraded by atmospheric attenuation. Apparent contrast as used in SEEKVAL Experiment IB1 is equivalent to absolute contrast since the distances involved were so short; no attempt was made to simulate atmospheric attenuation.

The effects of target/background contrast have been extensively studied both analytically and in laboratory experiments (see Blackwell, 1946; Lamar, et al, 1947; Taylor, 1960 (a) and (b); Vos, Lazet and Bouman, 1956). These studies are primarily concerned with contrast thresholds for simple targets of different sizes against uniform backgrounds. There have been few field tests or simulator studies of air-to-ground target acquisition in which apparent target/background contrast has been systematically varied. Thackham, Wade and Clay (1966) report a field trial in which target vehicles were located under conditions of "high," "medium," or "low" contrast, but no contrast measurements are reported. Their results showed that the high contrast condition gave significantly longer identification ranges for static targets than the low contrast condition.

In a simulation experiment, Jones and Bergert (1970) studied the effect of target/background contrast under closely controlled conditions in which the subject viewed the Martin Marietta terrain model directly. The contrast values of the targets against their backgrounds ranged from -0.05 to -0.15. No clutter existed within 1000 scaled feet of the targets. The results indicated that low contrast levels (-0.05 to -0.15) resulted in a large decrement in target acquisition. Contrast greater than -0.35 to -0.40 had negligible effect.

b. Clutter

Laboratory experiments have shown that as the number of objects in a complex visual field increases, target recognition performance deteriorates (Boynton and Bush, 1957; Christner, Schutz, and Ray, 1959; Williams and Borow, 1963). In air-to-ground target acquisition tasks the terrain is usually cluttered with objects other than the target. Simulations and field studies often have shown that the same effects occur: a greater degree of clutter usually leads to a deterioration in target acquisition performance. However, in a field study of clutter effects, Whittenburg, et al (1959a) compared the acquisition of targets located in relatively open areas with that of unconcealed targets placed close to natural terrain objects. No difference in performance was found. Similarly, a simulator study carried out by Bergert and Fowler (1970) showed that a background cluttered by non-target objects such as trees or rocks did not significantly affect the subject's ability to distinguish the targets, as compared with open field backgrounds. This same result was reported by Van Arsdall (1974).

A major problem in studying the effects of terrain clutter is that of quantifying the degree of clutter. This has been attempted by Nygaard, et al (1964) using various forms of sensor imagery, including aerial photographs. Using a stimulus-complexity analyzer to measure over-all background complexity, a curvilinear relationship was found between the analyzer measure of total object count and recognition performance for both photographic and infrared imagery. An inverse relationship was found between target recognition time and mean object size and object-size variance. These results suggest that it is possible to quantify some aspects of background complexity in relation to the real world.

c. Target Number

When a number of small targets are situated closely together, the effect may be one of a target complex, rather than one of individual targets. Dukes and McEachern (1955) and Van Arsdall (1974) found that grouped targets were detected more often than ungrouped or single ones. Whittenburg, et al (1960a) report that placing a series of different targets less than 3 seconds flying time apart tended to reduce identification scores. They suggest that this may have been due to a tendency for Observers to "lock on" or fixate one target at the expense of others nearby. It appears, therefore, that the effects of grouping heterogeneous targets is to facilitate detection of the group, but it may impair identification of its individual members.

d. Coloration

In their review of the literature, Jones, Freitag, and Collyer (1974, p. 3-22) conclude that color contrast does not have much effect on the visual range of target acquisition, primarily because of atmospheric attenuation. Using photographic imagery, Kraft and Anderson (1973) found no statistically significant difference between achromatic and chromatic imagery when displayed either stereoscopically or nonstereoscopically. However, a terrain table simulation reported by Van Arsdall (1974) did find statistically different target acquisition performance as a function of target color contrast with a green terrain background when brightness contrast was equated for the three tank target colors (brown, green, and gray). The scale of the terrain table (1000:1) necessitated short viewing distances, and no atmospheric degradation was used to make the simulation approach the real world color contrast attenuation by the atmosphere.

2.0 Environmental Variables

a. Illumination Level

A minimum level of illumination is required for successful direct vision target acquisition. The effect of illumination is such that above approximately 100 foot lamberts, increasing illumination level does

not improve performance (Jones, et al, 1974; Duntly, 1948). Field trial reports by Whittenburg, et al (1959b) indicate that short term changes in incident illumination did not have a significant effect on target acquisition performance.

b. Sun Azimuth

The effect of sun azimuth angle was studied in both field test and related simulation experiments by Blackwell, Ohmart, and Harcum (1958). They found that mean slant range of target acquisition increased as sun azimuth (relative to the line of flight) changed from 3 degrees through 177 degrees with data taken at 45, 90, and 122 degrees. Similar results were reported by Gordon and Lee (1959) who used a small battlefield simulation model with very low level (i.e., ground observation post) Observers. Elevation appeared to have a greater effect on performance than did azimuth. Freitag (1974) studied simulated sun angles of 0, 90, and 180 degrees on the AMRL 1000:1 terrain model simulator. He reported no significant main effects for sun angle as a function of slant range or time of search. However, the interaction of the 90-degree sun with hilly terrain significantly reduced slant range and increased search time when compared with the 0 and 180 degrees case.

c. Sun Elevation

No experimental studies on the effects of measured sun elevation on air-to-ground target acquisition are reported in the open literature.

3.0 Observer-Related Variables

a. Training as Aviators

In a simple laboratory search task Erickson (1965) reported no significant performance differences between high school boys and trained Naval aviators. In a simulator study using TV, King and Fowler (1972) reported no significant differences in performance between college students and experienced Navy pilots. However, the pilots were consistently better. A filmed simulation target acquisition study also found no difference between experienced pilots and non-pilots (Russis, et al 1965).

b. Visual Capability

The minimum visual requirements for military aviators are 20/20 visual acuity (corrected) and no visual perception of color anomalies. In view of these relatively stringent requirements, no serious investigations relating visual capability to target acquisition have been reported. However, a recent study by Williams (1974) indicates the spatial frequency response of the eye may, in fact, also be a significant contributor to visual acuity.

c. Other

Other possible Observer variables that have been investigated do not appear to significantly affect target acquisition visual search. Within the range of ages usually involved (21-45) age does not make a difference (Erickson 1964; Erickson 1966; Johnson, 1965). Sex differences do not affect target acquisition performance (King and Fowler, 1972; Parkes, 1972). Nor are there any reported difference in various tests of perceptual capability (Amundson, Schlanta, and Sorenson, 1974) or in personality measures (See 1973 AGARD TA Symposium).

4.0 Equipment-Related Variables

a. Aircraft Speed and Altitude

1 Within the range of typical speeds used to release most tactical ordnance (200 to 600 knots) there is little significant effect of flight speed on target acquisition. This typical result was reported by Valentine (1972) for example, where in field tests, no significant differences in target acquisition performance were found between a 300 knot and 450 knot air speed. In general review of the subject, Jones, et al, conclude that "speed, at least in the regimes of typical current tactical aircraft, is not a significant variable. What does seem important is that higher speed reduces time to search" (p 5-21).

2 Altitude - The most commonly found experimental result is that tactical target acquisition performance tends to improve almost linearly as altitude increases up to some maximum (Jones, et al, 1974). The slope of this curve is relatively small, however, for altitudes above about 500 feet (Blackwell, Ohmart and Harcum, 1960; Valentine, 1972). The experimental results are entirely predictable on the basis of the geometry, up to some maximum altitude, above which the target cannot be seen.

b. Use of Search Aids

The most commonly reported search aid is detailed prebriefing. Use of optical sights or television as aids to direct visual search have been reported in two controlled experiments, however.

1 Prebriefing - The experimental data are clear: the more detailed the prebriefing the better the target acquisition performance (Parkes, 1972b; Russis and Rawlings, 1966; JTF-II, Test 4.1, 1968). These reports typically were concerned with types of briefing materials. The effect of relative size of the prebriefed search areas was not reported.

2 Television - Almost all television target acquisition studies have used TV only, not as an aid to visual search. Fowler and Jones (1972), however, reported on an experiment conducted on the Martin Marietta terrain table simulator in which experienced pilots first detected the scaled 60-foot rectangular targets by direct vision and then transitioned to a television display in the cockpit for acquisition. Three fields of view were used. Mean range of acquisition for the 60-foot target was 5081 meters with a 4.8-degree television camera field of view (FOV), 3850 meters with a 9.6-degree FOV, and 3114 meters with a 14.5-degree FOV.

3 Stabilized Optics - Cheever and Harley conducted a well-controlled field test to determine target identification capabilities by Observers using a stabilized optics system (monocular) with up to 20X magnification, in a UH-1 helicopter. The aircraft flew at 2000 feet altitude along a prescribed course. Targets were marked with panels so that acquisition was easy; range of identification was the experimental measure. Thirty-two percent of targets were identified at 4000 meters. A maximum of 90 percent were identified by 1000 meters.

5.0 Terrain Table Simulation

A number of studies have used terrain tables or models as image source materials for electro-optical (EO) sensors, primarily TV. Other studies are system-specific and are not pertinent to this experiment. Reference and review to most can be found in Bliss (1969) and Jones, Freitag, and Collyer (1974).

a. Terrain Table Validation

The only reported air-to-ground target acquisition study that validates terrain table simulation with a related field test is that of Blackwell, Ohmart, and Harcum (1959).

1 Simulation - The tests were conducted by moving an electrically-driven dolly over a 600:1 scale terrain model at a simulated speed of 130 knots and simulated altitudes of 2000, 4000, 4500, and 7000 feet. The terrain model represented one square nautical mile of ground. Sunlight was simulated with a 5000 watt incandescent lamp in a 60-inch reflector. Sun angles, relative to the Observer, were 3, 45, 90, 122, and 177 degrees at an elevation of 45 degrees. The targets were three vehicles in line: jeep, 1/2-ton panel truck, and 2-1/2 ton truck. Observers were nine Naval Reserve pilots. A total of 840 runs were made on the

terrain model, with 10 possible target positions on the model. Many runs were made by each Observer against these same targets, with the targets at a different position each time. The positions were known to the Observers and were not used more than once per Observer, thus allowing the Observers to use a process of elimination on the target positions as the test proceeded.

2 Flight Test Validation - A total of 109 flight passes were conducted against the real targets of which the models were a simulation. The targets were located in a one square nautical mile area of which the terrain model was a generally faithful simulation. As in the simulation, the three stationary targets were always grouped as an in-line convoy. The acquisition task consisted of the pilot's stating the heading of the convoy and the order of the vehicles. Slant range at this point was measured.

3 Results - There were significant differences between simulator and flight trials, although the trends were the same. Averaged over all passes, the overall acquisition probability from the simulated experiment was 0.89, with a mean range of 4891 meters, whereas under field conditions, acquisition probability was 0.60 with a mean range of 3403 meters. Large subject variability occurred from trial to trial in both test situations. The simulator acquisition probability and range data tended to be about 30 to 40 percent better than the field test data.

b. Other Pertinent Research

1 A 1000:1 terrain table simulation was conducted at the Aerospace Medical Laboratory (AMRL) as the SEEKVAL IA1 test series (Van Ardsall, 1974). A series of three experiments were conducted. The first examined the effects of number of targets (1, 3, and 9 tanks) and clutter on dynamic (Observer moving) acquisition performance; the second addressed the effects of the same factor on static (Observer stationary) acquisition performance; and the third examined the effects of variations in color and brightness contrast on acquisition performance. In dynamic situations the Observer "flew" by the target at simulated 3500 feet altitude at a speed of 300 knots at a minimum range of approximately 2200 meters. In the static experiment the Observer was uncovered at several altitudes from 583 to 3500 feet. Target to background contrasts of -0.20 and -0.60 were used. In both the dynamic and static modes, the effects of number of targets were more important than those of

clutter on detection performance; there were no significant effects due to interaction between targets and clutter elements. Effects on target acquisition due to color and brightness contrast were each statistically significant; however, interaction effects between these two factors were not statistically significant. For the same absolute brightness contrast, targets darker than their background were more difficult to detect than targets lighter than their background. Overall, the rate of correct target acquisition was about 40 percent.

2 Using the same AMRL terrain table, Freitag (1974) investigated effects on 0, 90, and 180 degrees sun angles (at an initial elevation of about 40 degrees) on target (tank) acquisitions in hilly and flat terrain. Thirty subjects were used to view two targets each in a static search situation. The sun was simulated by use of a 5000 watt floodlamp. Each subject started at 8500 feet slant range at 3500 feet altitude and was allowed a 30-second search time. If the target was not found the subject was moved in 500 feet and the trial repeated. The results of the tests indicated no overall significant difference for sun angle on either slant range or search time. However, for the hilly portion of the terrain, the 90 degree sun angle had a significantly shorter slant range and required significantly more search time than did the 0 and 180 degrees sun angle.

APPENDIX D

GENERAL EXPERIMENTAL PROCEDURES

1.0 Observers

a. Selection

Trained military aviators were provided by the SEEKVAL Joint Test Director. Sub-experiments 1, 2, and 3 required military Observers trained in fixed-wing aircraft. These were supplied by the Air Force, Navy, and Marines. Sub-experiments 4 and 5 required military Observers trained in helicopters. These were supplied by the Army and Marines.

Untrained Observers were supplied by Martin Marietta for sub-experiments 1 through 5. To eliminate unmotivated or otherwise unsuitable subjects, all Martin Marietta candidates were informed of the SEEKVAL program objective, general testing concepts, and expected individual performance requirements before volunteering. All untrained Observers were unskilled in target acquisition techniques, and had no current military flight experience.

The untrained Observers matched the trained Observers in numbers so that identical tests could be run, one by a trained and one by an untrained Observer.

b. Handling

All Observers reported to the briefing room and were given a folder which contained general information about the experiment and a subject questionnaire to be completed on personal history, such as age and flight experience.[1] A vision test followed, with visual acuity as well as color vision tested using a Bausch & Lomb Orthorater. Martin Marietta personnel who failed to achieve 20/20 vision, corrected in both eyes, and full color vision were excluded from further participation in the program. Visual status for all Observers was recorded on their subject questionnaires. A few untrained Observers were used who had marginal 20/20 vision or who had slight color vision deficiency. A subject number was assigned to each Observer which included, as a suffix, his visual status (see Appendix G). After screening, all Observers viewed a color videotaped briefing, designed to provide all Observers with a standardized level of knowledge about the optical laboratory, terrain table layout, simulated cockpit (habitat), and general test procedures, and to assure that all Observers knew what to expect during the experimental trials.

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[1] See Appendices I and J for materials used in briefing and debriefing.

After viewing the tape, the Observers were given a target area briefing and shown a map representative of the terrain model, marked with the six (or four) separate target areas. The subjects were also shown an oblique photograph of the terrain model, taken from the cockpit, at the approximate angle at which the Observer would see the terrain, and close-up oblique photographs of the six target areas. No actual targets were included on these photographs.

A search method was assigned to each Observer, followed by a practical familiarization in a mock-up of the actual cockpit, the equipment, and controls to be used by the Observer during the test runs.

The Observers were then transferred from the briefing room to the holding room to wait their turn for the test runs.

The Experimenters escorted the Observers to the optical laboratory and into the cockpit, and again checked out the Observer as to the specific test procedures and the operation of controls and displays.

For the test runs, the Observer carried a copy of the oblique photograph of the terrain, with the six target areas identified, to be used as a mission briefing and acquisition debriefing reference during each run.

Upon completion of the run-set, the Experimenter escorted the Observer to the debriefing room. There the Observer filled out a debriefing questionnaire and was asked to avoid detailed discussion of the experiment with other potential Observers. The Observer was then dismissed.

2.0 Data Recording and Handling

a. Data Recording

In order to assure "data security," redundant data paths were established for the IB1 experiments. For initial data recording, the redundancy was implemented by having the Experimenter manually fill in the Experimenter's check sheet and manual log form (see Appendix F) and by requiring him to key-in the data using the Xerox BC200 data terminal equipment mounted in the Experimenter's station. A 14-inch studio monitor provided a readout for the Experimenter, identified the a priori run-set parameters, and provided cues for the Experimenter so that the proper data were keyed in when required.

At the beginning of a run-set, the monitor displayed a request for run-set number; when the Experimenter keyed in the desired number, the a priori run-set requirements, as previously input to the digital computer test plan, were displayed on the monitor and on the repeater at the analog computer operator's station. The monitor display then called for the Observer's serial number. This number, which had been obtained from the briefer and had been entered in the manual log, was then keyed in and displayed. The display then requested the Experimenter's name and the decimal

number (the target number of the first run). When these had been supplied by the Experimenter, the display announced that the computer was ready for the runs to start.

At this stage, all the data except the acquisition data were on display and were stored by the computer. It appeared as shown in Appendix F display "a," except that the encircled acquisition data had not yet been provided. The start and stop signals for the run initiated the sequences that provided range and time (or time only for the helicopter runs) data. These were shown on the displays as acquisition data and were recorded for the digital print-out.

Immediately following each run, the Observer was debriefed by the Experimenter, the number of good and bad targets was assessed, and a remarks code (see Appendix F) selected. These additional data were entered in the Experimenter's check sheet and manual log, and were keyed into the BC200, going to the displays and to the digital computer print-out. This completed the initial data recording function for each run. Multiple cross checks and verifications were used to provide the level of data credibility required.

b. Data Handling and Verification

At the end of each run the analog computer operator manually entered the Observer's serial number, the Experimenter's name, the acquisition data, and the "remarks" code on a FORTRAN loading form; the a priori data for each run set had been previously entered. Also, at the end of each run, the analog computer operator annotated the analog strip charts so that a backup measurement of range and time was available.

At least once every running day, all Experimenter's manual logs were checked against the FORTRAN loading form. If a discrepancy was discovered, the digital printout and the annotated analog strip chart were consulted, if necessary, and resolution was obtained. From the FORTRAN loading form, card decks were punched and used to provide several printouts which formed the basis for data analysis.

The first step in the preliminary data analysis provided yet another data check. For each terrain table configuration, a matrix of acquisition data was prepared manually. These matrices provided a quick-look at result trends and in addition any occurrence of duplication in parameters or the existence of any blanks in the matrix values identified an error. These were few, but in each case, the alternative data sources were investigated, resolution obtained, and cards and tab runs corrected.

c. Data Procedural Variations

Because of the variation in inputs and data among the several experiments, the detailed data procedure had to be altered from experiment to experiment. These alterations are identified in the section pertaining to the individual experiments.

d. Record Photographs

Record photographs were taken of each table configuration as follows:

1 Color - Oblique view of each target area

2 Color - Closeup (near vertical) of each target array

3 Black and White - Oblique view of each target array

Color photographs for terrain table configurations A through J (sub-experiments 1-4) were taken without internal color reference since they were intended only to convey the general appearance of the terrain mode. For sub-experiment 5 (terrain table configurations K - N), however, where color was a controlled variable, the gray scale target, a calibrated Kodak 14-inch gray scale modified to incorporate two gray spheres and identifying data, is present in the closeup photographs.

The black and white photographs were taken at a slant range of 12,000 feet (scaled) for table configurations A through F (sub-experiments 1-3) and 2850 meters (scaled) for table configurations G through N (sub-experiments 4 and 5). Altitudes were 3000 feet (scaled) for table configurations A through F and 1300 feet (scaled) for table configurations G through N.

A Petri 35 mm SLR camera with a 300 mm, f/6.9 telephoto lens was used for terrain table configurations A through G black and white photos. Due to mechanical damage to the Petri, a Nikon 35 mm SLR with a 200 mm f/4 telephoto lens was used for Tables H through N. The Petri photographs were taken at f/6.9, 1/2 second; and the Nikon photographs were taken at f/5.6, 1/2 second. Panatomic-X film was used in all cases; normal D-76 developer was used.

3.0 Methods of Analysis

a. General Methodology

The primary statistical technique used for analysis of the data was Analysis of Variance (ANOVA). The experimental designs were generally characterized by the fact that each Observer received all levels of one factor (clutter/contrast), and only one level of the remaining factors. Winer (1972)[1] used the designation "multifactor experiments having repeated measures" for this class of design. Because of a large amount of missing

[1] G.J. Winer, "Statistical Principles in Experimental Design," 2nd Ed., New York: McGraw-Hill, 1972.

data (due to missed acquisitions), especially in sub-experiments 1, 2, and 3, the General Linear Model (GLM) run as the BMD10V program of the Biomedical Computer Programs package was used to generate missing values. Non-parametric methods, primarily chi-square, were used to analyze the data where only number of acquisitions was the proper variable of concern (Siegel, 1956[2]).

Cumulative probability of acquisition was also plotted for a variety of conditions. No statistical test of these distributions was conducted. In all cases, the .05 level of significance was chosen as critical.

b. Non-Parametrics

Whenever measured values could not be used in the GLM ANOVA (e.g., in sub-experiment 2) a non-parametric statistic was used. The appropriate statistic was, in nearly all cases, chi-square. For sub-experiments 4 and 5 a test difference between medians (Siegel, p 179-184) was used for some comparisons. Any evaluations of numbers of targets acquired, as differing from range or time of acquisition, was conducted using chi-square.

c. Analysis of Variance

An analysis of variance was used to test for statistical significance of the various factors when the measured response was detection range or detection time. For analysis purposes it was assumed that all factors, except Observers which were randomly selected, were fixed effects. In all of the experiments there was a significant amount of missing data; that is, the Observer failed to acquire the target. The fixed wing experiments averaged about 40 percent acquisitions and the rotary wing experiments averaged about 90 percent acquisitions.

Because of the large amount of missing data, standard techniques could not be used to perform the ANOVA. Therefore, the GLM was used. A Biomedical Computer Program, BMD10V, was used to estimate the parameters and test the hypotheses concerning a general linear model. While BMD10V will accommodate missing data, it does have some disadvantages. The number of parameters, i.e., the number of dummy variables the analysis of variance generated, which could be included in the model was less than 80. For most of the experiments only the main effects and the two-way interactions could be included in the model. Also, because of missing data, the number of parameters estimatable was further reduced. If the missing data was not random, but correlated to one of the variables, the program gave erroneous results. In fact, the medium and high clutter conditions had significantly fewer data points. Therefore, these results must be viewed with some caution.

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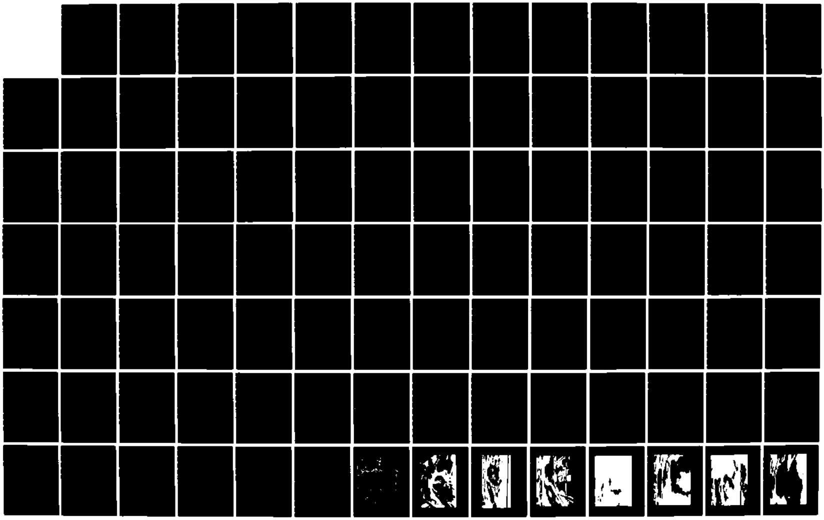
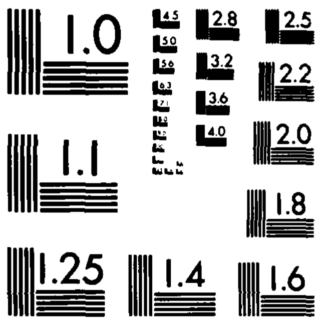
[2] S. Siegel, "Non-parametric Statistics for the Behavioral Sciences," New York, McGraw-Hill, 1956.

AD-A145 164 JOINT TEST PROJECT REPORT OF COMBAT AIR SUPPORT TARGET ACQUISITION PROGRA..(U) MARTIN MARIETTA AEROSPACE ORLANDO FL P B BRIGHAM SEP 75 OR-13698 3/4

UNCLASSIFIED F29601-74-C-0122 F/G 17/8 NL





MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

In sub-experiments 1, 2, and 3, the distribution of range of detection was approximately normal; therefore, no transformations were used. However, in sub-experiments 4 and 5, the distribution of time of detection was highly skewed. In analyzing these experiments a logarithmic transformation was used. A transformed value of $X' = \log(X + 1)$ was used and results in a distribution which was approximately normal.

APPENDIX E

DETAILED OPERATING PROCEDURES

SEEKVAL EXPERIMENT IB1
PROCEDURE SVIB1-1
READY ROOM BRIEFING

1. Open Ready Room at 0730. Turn on TV to warm up.

2. Pick up Observers at GDC gate. Escort to Ready Room.

3. Hand to all Observers SVIB1-1A or SVIB1-1B Ready Room Briefing Folder.

4. Answer any questions to best of your ability.

5. Have all Observers fill out questionnaire and background information data.

6. Assign each Observer a serial and run number. Record the numbers on the daily log and on all forms pertaining to that Observer: questionnaire, vision test, etc.

7. Give each Observer the vision test (glasses are permitted) on both the orthorater and the selected color cards. Record test results on the Observer's records and assign the correct suffix to the Observer serial number.

   NOTE: (a) Regardless of test results all military Observers will complete the test series.

   (b) If a Martin Marietta Observer fails the eye examination he will be excused from further participation.

   CRITERIA: Vision no less than 20:20 corrected with glasses. No color anomalies on the color plates.

   (c) If an Observer must wear glasses to achieve the required vision level, note this on the record so that the Experimenter can require it on test runs.

8. Show all Observers the SEEKVAL TV briefing tape.

9. Conduct mission briefing.

10. Use mockup to demonstrate how the equipment on the cockpit simulator works. Assign search methods.

11. All Observers are transferred to the Holding Room after they have been briefed and must remain there until their turn is scheduled. When ready, a test Experimenter will pick them up. Caution all Observers that after the test is run they will not be allowed in the Ready Room. Any personal gear left in the Ready Room during the experimental run can be picked up while the Observer is escorted after the test run.

    NOTE: Do not allow discussion between new and old Observers at this time. All Observers will leave the GDC area immediately after the test.

12. Information and help about travel reservations, etc., can be made through R&T Marketing: Call X4404 or 4564. Let the Military subjects make those arrangements if needed.

    NOTE: Briefing materials associated with this procedure may be found in Appendices I and J.

SEEKVAL EXPERIMENT IB1
PROCEDURE SVIB1-2
MISSION BRIEFING

1. Pick up Observer at Holding Room. Get his name and subject number from briefer.

2. Verify search method to be used with briefer, direct vision or visual aid (copy attached). Make sure that your instructions are correct and match the type of experiment being conducted.

3. Assure that Observer is completely familiar with cockpit and procedures to expect in the test run.

4. Assure that all Observers have seen and are familiar with the terrain map and aerial photograph.

   NOTE: All Observers should be at an equal knowledge level and have read the target acquisition instructions.

5. Answer any questions to the best of your ability.

6. Escort Observers to Optical Laboratory. Enter by the southwest door.

7. Check that Optical Laboratory is set up and ready. Escort Observer into habitat. Caution Observer not to look at terrain table. Walk on Observer's left to effectively screen his view of terrain table.

SEEKVAL EXPERIMENT IB1
PROCEDURE SVIB1-3
HABITAT BOARDING

1. Prior to introducing the Observer to the optical room for cockpit boarding, the following conditions will exist:

   a. Sun Simulator positioned and on if required.

   b. Terrain model reset to north end and lab in hold.

   c. Cockpit at floor level with vertical beam drive turned off and vision mask in place (helicopter runs).

   d. Observer briefed for mission.

2. Experimenter will escort the Observer to the cockpit, requesting that he not look at the terrain model.

3. Observer enter habitat. Experimenter point out low head clearance. Experimenter assist with strapping in as required.

4. Observer should don helmet and adjust the helmet sight as required.

5. Experimenter assist with seat adjustment for correct eye position and comfort.

6. Boresight helmet sight (if applicable).

7. Experimenter brief Observer on location and function of needed controls and refresh his memory on what he will be doing.

8. Allow the Observer several practice sessions with the controls that he will use. All Observers should be familiar with and be able to operate the controls before test run starts.

9. Give run briefing.

10. Experimenter board his station, strap in, and don head set. Close the curtain in front of the Observer.

11. Experimenter check communications with test conductor and Observer.

12. Experimenter check monitor test parameter display against Experimenter Check Sheet and visually verify lab setup.

13. Energize vertical drive on Experimenter's command and position cockpit vertically.

14. Vertical drive off.

15. Lateral drive on at Experimenter's command and position cockpit laterally.

16. Lateral drive off.

17. Experimenter enter Observer's identification number into computer.

18. Verify that computer and your written log are both the same for the run.

19. Ensure Observer can distinguish the target area boundaries and identify a narrow area of search within the area. Begin run.

20. Verify each target location by requesting verbal description of target and target area. Record results on Experimenter's Check Sheet and in computer.

SEEKVAL EXPERIMENT IB1
PROCEDURE SVIB1-4
RUN BRIEFING

1. Assure Observer is in cockpit, helmet sight positioned, and Observer is familiar with all required controls.

2. Read run briefing for each of the several targets in turn.

3. Verify each target location by requesting verbal description of target and target areas, and check with target oblique photo if necessary. Record results on evaluation sheet and on computer.

4. Repeat 2 and 3 for each run.

SEEKVAL EXPERIMENT IB1
PROCEDURE SVIB1-5
RUN

1. Prior to executing this procedure, the mission and specific run briefing shall have been completed.

2. Experimenter verify lab and Observer ready and signal via his keyboard.

3. Experimenter start run by depressing START button.

4. Experimenter check curtain up, model in motion (if applicable) and Observer's display active if applicable.

5. Experimenter watch Observer and make notes of exceptional behavior.

6. NOTE: If Observer has not found target by time the target area is out of field of view, push curtain down to end run. Record as no target found.

7. At run end, Experimenter note curtain down, debrief subject, and note results on computer printout. Reset as applicable and enter results via keyboard and record on the Manual Log. After pressing SEND, verify correct information transmitted. Experimenter's log and computer should be redundant copies of the run.

8. Brief next run and return to step 2; if Observer has completed his mission proceed to Habitat Disembarking, Procedure SVIB1-7.

SEEKVAL EXPERIMENT IB1
PROCEDURE SVIB1-6
SOLAR SIMULATOR POSITIONING

1. Prior to executing this procedure, the following conditions will exist:

   a. Terrain model positioned near center of lab and lab in hold condition.

   b. Boom lowered and retracted and positioned along vehicle longitudinal axis.

2. Uncouple from the terrain model and retract coupling arms.

3. Drive simulator to new position using caution to avoid running over or snagging lamp power cable.

4. Couple to terrain model and check attachments.

5. Position boom to required elevation, azimuth and extension. When under balcony, use care to avoid hitting lights or balcony structure.

6. With lamp on, adjust tilt/pan to illuminate the proper area.

SEEKVAL EXPERIMENT IB1
PROCEDURE SVIB1-7
HABITAT DISEMBARKING

1. Prior to proceeding with this procedure, the terrain model will be reset to the north end and lab placed in hold.

2. Lower habitat to floor level ensuring that it is laterally positioned so that Observer can disembark well clear of trenches. Turn vertical drive off.

3. Experimenter exit his station and assist Observer in removing helmet and to disembark.

4. Experimenter escort Observer to Debriefing Room and debrief.

SEEKVAL EXPERIMENT IB1
PROCEDURE SVIB1-8
MISSION DEBRIEFING

1. Experimenter read debriefing material.

2. Have Observer complete the debriefing questionnaire.

3. Escort Observer to gate or leave in debriefing area at his option.

4. Ensure no contact with other Observers until their run sets are complete.

SEEKVAL EXPERIMENT IB1
PROCEDURE SVIB1-9
DAILY LABORATORY VERIFICATION

NOTE: Steps 1 through 11 apply to fixed wing sub-experiments 1, 2, and 3 only.

1. Turn on television, 2-axis gimbal, and helmet sight equipment.

2. Verify terrain model velocity of 0.89 feet/second.

3. Check reset position of terrain model at north end of lab.

4. Check cockpit initial lateral positions.

5. Check cockpit altitude above the floor.

6. Measure and record overhead lighting level at the terrain model surface directly under the overhead hoist under two conditions:

   a. high level (overcast sky) 500 foot-candles approx.

   b. low level (skylight) 100 foot-candles approx.

7. Position solar simulator for first run of the day, turn on, allow to stabilize (approx. 5 minutes) and measure near center of beam at terrain model surface. Reading should be approximately 500 foot-candles.

8. Compare reading taken under 6b. with 7. If 6b. is not approximately 20 percent of 7, proceed in accordance with Procedure SVIB1-17, Lighting Adjustments.

9. Man the cockpit, Experimenter's station, and test conductor's station and perform the following checks:

   a. Communications

   b. Helmet sight boresight and gimbal control

   c. Transition from helmet sight to track stick control

   d. Autofocus

   e. Observer's display quality

   f. Data entry, transmission and recall

   g. Experimenter's control functions

   h. Test conductor's control functions

i. Observer's event mark function

j. Observer's vision mask (curtain)

k. Zoom control.

10. Set up annotated video tape identification board, train sensor on the board, zoom down to board and make a 15 second video recording. While recording, read board aloud over Observer's microphone. Play tape back and verify video and audio recording quality. Advance tape past identification recording.

11. Inspect terrain model for setup for first run and check for foreign objects. If necessary, vacuum or sweep open areas.

NOTE: Steps 12 through 19 apply to experiments 4 and 5 only.

12. Turn on television, 2-axis gimbal, and pantograph equipment.

13. Check cockpit initial lateral positions.

14. Check cockpit altitude above floor for:

    a. 800 foot simulation

    b. 1300 foot simulation

    c. 1800 foot simulation as applicable for the day's runs.

15. Check terrain table positions for three standoff ranges from four targets as applicable for day's runs.

16. Measure and record overhead lighting level at the terrain model surface directly under the overhead hoist: 500 foot-candles approx. If the level is incorrect, proceed in accordance with Procedure SVIB1-17, Lighting Adjustments.

17. Man the cockpit, Experimenter's station, and test conductor's station and perform the following checks:

    a. Communications

    b. Pantograph boresight and gimbal control

    c. Transition from pantograph to track stick control

    d. Autofocus

    e. Observer's display quality

    f. Data entry, transmission, and recall

g. Experimenter's control functions

h. Test conductor's control functions

i. Observer's event mark function

j. Observer's vision mask (curtain)

k. Zoom control.

18. Perform Step 10

19. Perform Step 11.

SEEKVAL EXPERIMENT IB1
PROCEDURE SVIB1-10
TABLE CHANGES

NOTE: Steps 1 through 7 are applicable to terrain table configurations A through J only.

1. Review requirements for the next table configuration per Chart SVIB1-10A and determine the most efficient method of making the change, e.g., in many cases the target array in a particular area will not change.

2. Remove target and clutter elements which are to be replaced.

3. Add new targets.

4. For table configurations A through F, add new clutter so that no tree is closer to a tank than 2.8 times the tree height along any of the possible sun bearings and no closer than 1.5 times tree height in any case. This will assure that clutter shadows will not impinge on tanks. Also ensure that trees will not obscure the targets from the Observer's eye level at the initial position viewing angle.

5. For table configurations G through J, add new clutter so that no tree is closer to a tank than 1.5 times tree height and that no tree obscures a tank from any initial position.

6. Take photometric measurements of areas with new target tanks per Procedure SVIB1-11. If any contrast measurement is beyond limits, repaint targets as required.

7. Make photographs for record per Procedure SVIB1-12.

NOTE: Steps 8 through 15 are applicable to terrain table configurations K and M only.

8. Clear all target areas of targets and clutter.

9. Apply background color as called for by Chart SVIB1-10A to all target areas. The color should be relatively homogeneous within a 75 meter radius of the surveyed location and blending gradually into the surroundings beyond that range.

10. Insert pattern painted tanks in all four areas. These tanks must be identified and reserved for later use in the same positions.

11. Take photometric measurements per Procedure SVIB1-11. Adjust background colors as required to achieve -0.5 ± 0.1 contrast.

12. Replace pattern painted tanks with OD tanks similarly identified and make photometric measurements. Adjust tank colors for -0.5 ± 0.1 contrast.

13. Remove OD tanks from two areas and substitute dedicated pattern painted tanks per Chart SVIB1-10A.

14. Add clutter elements as specified in Chart SVIB1-10A observing the same criteria for location as specified in Step 5.

15. Make photographs for record per Procedure SVIB1-12.

    NOTE: Steps 16 through 18 are applicable to terrain table configurations L and N only.

16. Remove all tanks and replace with dedicated tanks per Chart SVIB1-10A.

17. Take photometric measurements of all areas per Procedure SVIB1-11.

18. Make photographs for record per Procedure SVIB1-12.

CHART SVIB1-10A
SEEKVAL IB1 TARGET AREA DESCRIPTIONS

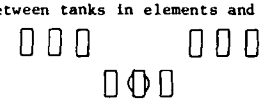
Experiment	Table	Target Area 1		Target Area 2		Target Area 3		Target Area 4		Target Area 5		Target Area 6		Notes
		Target	Clutter	Target	Clutter	Target	Clutter	Target	Clutter	Target	Clutter	Target	Clutter	
1	A	3 Light OD	None	3 Light OD	20 Trees	3 Light OD	60 Trees	3 Dark OD	None	3 Dark OD	20 Trees	3 Dark OD	60 Trees	Note 1
	B	3 Dark OD	60 Trees	3 Light OD	None	3 Light OD	20 Trees	3 Light OD	60 Trees	3 Dark OD	None	3 Dark OD	20 Trees	Note 1
	C	3 Dark OD	20 Trees	3 Dark OD	60 Trees	3 Light OD	None	3 Light OD	20 Trees	3 Light OD	60 Trees	3 Dark OD	None	Note 1
	D	3 Dark OD	None	3 Dark OD	20 Trees	3 Dark OD	60 Trees	3 Light OD	None	3 Light OD	20 Trees	3 Light OD	60 Trees	Note 1
	E	3 Light OD	60 Trees	3 Dark OD	None	3 Dark OD	20 Trees	3 Dark OD	60 Trees	3 Light OD	None	3 Light OD	20 Trees	Note 1
1 and 3	F	3 Light OD	20 Trees	3 Light OD	60 Trees	3 Dark OD	None	3 Dark OD	20 Trees	3 Dark OD	60 Trees	3 Light OD	None	Note 1
2	F_1	None	20 Trees	1 Light OD	60 Trees	3 Dark OD	None	1 Dark OD	20 Trees	3 Dark OD	60 Trees	9 Light OD	None	Note 1 Note 2 Note 3
	F_2	9 Light OD	20 Trees	3 Light OD	60 Trees	1 Dark OD	None	None	20 Trees	1 Dark OD	60 Trees	3 Light OD	None	Note 1 Note 2 Note 3
	F_3	3 Light OD	20 Trees	1 Light OD	60 Trees	3 Dark OD	None	9 Dark OD	20 Trees	None	60 Trees	1 Light OD	None	Note 1 Note 2 Note 3
	F_4	1 Light OD	20 Trees	3 Light OD	60 Trees	1 Dark OD	None	3 Dark OD	20 Trees	9 Dark OD	60 Trees	None	None	Note 1 Note 2 Note 3
4	G	3 Light OD	None	3 Light OD	20 Trees	3 Dark OD	None	3 Dark OD	20 Trees	Note 1*				
	H	3 Light OD	20 Trees	3 Dark OD	None	3 Dark OD	20 Trees	3 Light OD	None	Note 1*				
	I	3 Dark OD	None	3 Dark OD	20 Trees	3 Light OD	None	3 Light OD	20 Trees	Note 1*				
	J	3 Dark OD	20 Trees	3 Light OD	None	3 Light OD	20 Trees	3 Dark OD	None	Note 1*				
5	K	3 OD on Brown	20 Trees	3 OD on Green	60 Trees	3 Patterned on Brown	None	3 Patterned on Green	20 Trees	Note 1*				
	L	3 Patterned on Brown	20 Trees	3 Patterned on Green	60 Trees	3 OD on Brown	None	3 OD on Green	20 Trees	Note 1*				
	M	3 Patterned on Green	20 Trees	3 Patterned on Brown	60 Trees	3 OD on Green	None	3 OD on Brown	20 Trees	Note 1*				
	N	3 OD on Green	20 Trees	3 OD on Brown	60 Trees	3 Patterned on Green	None	3 Patterned on Brown	20 Trees	Note 1*				

*In experiments 4 and 5, tank headings will be SE in areas 1 and 2, SW in areas 3 and 4.

Note 1 - 3-Tank arrays positioned in line abreast; areas 1, 2, and 3 (FW) heading SE, areas 4, 5, and 6 (FW) heading SW, center tank on surveyed spot, 50 meters [2.46" at 800:1 / 9.84" at 200:1] between tanks.

Note 2 - Single tanks positioned on surveyed spot, pointed SW or SE as in Note 1.

Note 3 - 9-tank arrays positioned with 3-tank elements in line abreast, elements in "V" formation. Center tank of lead element on surveyed spot, 50 meter interval between tanks in elements and between elements per sketch:



Headings same as Note 1

SEEKVAL EXPERIMENT IB1
PROCEDURE SVIB1-11
PHOTOMETRIC MEASUREMENTS

NOTE: This procedure will be accomplished at any time that target tanks are changed or when a background color has been changed in a target area.

1. Turn on full overhead fluorescent lighting.

2. Position terrain model south of the center of the lab.

3. Measure the light level in foot-candles at the terrain model surface.

4. Set up the Pritchard photometer with the 2 foot aperture for 800:1 scale (sub-experiments 1, 2, and 3) or the 6-foot aperture for 200:1 scale (sub-experiments 4 and 5). Mount the photometer on the habitat and position the terrain model and the habitat so that the photometer head is 3.75 feet above the terrain surface at a 15 foot slant range south of the target for sub-experiments 1, 2, and 3. Sub-experiment 4 and 5 use 6.5 feet altitude and 46.75 feet slant range.

5. Scan each tank in an area in turn, measuring and recording the average luminance based on the area of the tank visible to the photometer. Use Form SBIB1-11A for recording.

6. Scan the terrain model surface within a 6 inch radius around the tank array and record the average value.

7. Compute contrast of each tank/background as follows:

$$C = \frac{TI_{(AVG)} - BI_{(AVG)}}{BI_{(AVG)}}$$

where: $TI_{(AVG)}$ = Average tank illuminance

$BI_{(AVG)}$ = Average background illuminance

For sub-experiments 1 through 4, contrast must equal -0.2 to -0.5 for low contrast areas and -0.6 to -0.9 for high contrast areas. For sub-experiment 5, contrast must be -0.5 ± 0.1. In the event of discrepancy, see Procedure SVIB1-10.

FORM SBIB1-11A
PHOTOMETRIC MEASUREMENTS

Table ______________ Date ______________ By ______________

	Luminance Reading						
Target Area	North	Tank Center	South	Back- ground	Negative Contrast Ratio North	Center	South
1							
2							
3							
4							
5							
6							

SEEKVAL EXPERIMENT IB1
PROCEDURE SVIB1-12
PHOTOGRAPHIC RECORDING

NOTE: This procedure is applicable whenever a new terrain model setup is completed and normally will be accomplished prior to making runs. Film used will be Kodacolor II.

1. Position terrain model with south end near habitat.

2. Turn on full overhead lighting.

3. Attach tripod to front of habitat.

4. Station photographer in habitat and position habitat and terrain model for optimum framing of six or four target areas individually and photograph.

5. Position cockpit and terrain model for optimum framing of entire model surface and photograph (optional step).

6. Process film, make two 8 x 10 color prints of each and record negative numbers.

7. Retain prints in the data file.

SEEKVAL EXPERIMENT IB1
PROCEDURE SVIB1-13
DATA HANDLING

1. Data generated in the course of these experiments will take the following form.

   a. Daily run schedule and log, Form SVIB1-16A

   b. Photometric measurements, Form SVIB1-11A

   c. Record photographs of target areas for each table configuration (2 copies)

   d. Observer Audit

   e. Observer initial testing record (2 copies)

   f. Lighting level record, Form SVIB1-17A

   g. Pre-run computer printout (2 copies)
      Copy 1 - Experimenter's run log
      Copy 2 - Test Conductor's run log

   h. Post-run computer printout (2 copies)

   i. Data cards (2 sets)

   j. Video tapes

   k. Master experimental log

   Handling and disposition of these data will be as specified in the following paragraphs.

2. DAILY RUN SCHEDULE AND LOG - This form will be prepared each afternoon for the following day's runs. It will be used to generate the two copies of the pre-run computer printout (item l.g.). The form will be retained in the master experimental log and delivered with the final report.

3. PHOTOMETRIC MEASUREMENTS - This form will be prepared for each unique table configuration and as required. The original will be retained in the master experimental log and delivered with the final report.

4. RECORD PHOTOGRAPHS - These photographs will be taken of each unique table configuration and as required. One set will be retained in the master experimental log and delivered with the final report. One set will be available for general use.

5. OBSERVER AUDIT - One copy will be retained in the master experimental log and delivered with the final report.

6. OBSERVER INITIAL TESTING RECORD - One copy will be retained in the master experimental log and delivered with the final report.

7. LIGHTING LEVEL RECORD - This form will be prepared whenever a change in lighting level occurs and will be retained in the master experimental log and delivered with the final report.

8. PRE-RUN COMPUTER PRINTOUT - One copy will be used by the Experimenter as a run schedule. A second copy will be used by the test conductor as a run schedule and as a log for recording significant events or anomalies. The second copy will be retained in the master experimental log and delivered with the final report.

9. POST-RUN COMPUTER PRINTOUT - One copy will be used as the source for key-punching data cards (item 1.i.) and will be retained in the control room for reference.

10. DATA CARDS - These cards will be prepared daily. One set will be retained in the control room and will be used in the final analysis process and delivered with the final report. The other set will be delivered daily to SEEKVAL East.

11. VIDEO TAPES - These tapes, recording all experimental runs, will be retained in the Martin Marietta program office and delivered with the final report.

12. MASTER EXPERIMENTAL LOG - This log will be retained in the Martin Marietta program office and delivered with the final report.

SEEKVAL EXPERIMENT IB1
PROCEDURE SVIB1-14
DEFINITIONS

ACQUISITION ATTEMPT - A single exposure of the terrain model to the Observer for the purpose of target detection and recognition.

ALTITUDE - The distance from the Observer's eye level to the mean terrain model elevation plane.

CLUTTER - Vegetation within a 200 meter radius of a surveyed target location which could be mistaken for a tank. The three levels of clutter used in this experiment are defined as follows:

Low - No clutter within 200 meter radius

Medium - 20 trees or shrubs within 200 meter radius

High - 60 trees or shrubs within 200 meter radius

CLUTTER AREA - A 200 meter radius circle surrounding the surveyed target location which contains the clutter level prescribed by the test plan.

COCKPIT - Cockpit simulator which is Observer's station. Also referred to as habitat.

CONTRAST - The difference between target and background luminance divided by background luminance, i.e.,

$$C = \frac{T - B}{B}$$

For all experiments except 5, there will be two contrast levels used

High = -0.6 to -0.9

Low = -0.2 to -0.5

CONTROL ROOM - Area west of optical room containing primary optical room control equipment and computer complex.

EXPERIMENTER - One of two individuals whose function is to accompany and watch Observers during their experimental participation. He is also responsible for recording and entering Observer's data. Also may be referred to as umpire.

EXPERIMENTER'S STATION - Structure mounted next to the cockpit from which the experimenter watches the Observer and performs his control and data input functions.

HABITAT - Cockpit-like structure which is the Observer's station for his acquisition attempts.

HORIZONTAL RANGE - The horizontal distance from a vertical line through the Observer's eye position to a particular location on the terrain model, usually a surveyed target location.

MEAN TERRAIN MODEL ELEVATION (MTME) - Defines a horizontal plane through the terrain model at the approximate mean of the elevations of the six surveyed target locations. All altitude measurements are referenced to the MTME.

MISSION - Group of all target acquisitions or runs attempted by one Observer. Normally six runs in experiments 1, 2, and 3; and 4 runs in experiments 4 and 5.

OBSERVER - Synonymous with subject.

OPTICAL ROOM - The area containing the terrain model, solar simulator, habitat, and Experimenter's station.

RUN - Single attempt to acquire targets in a given target area. A run commences with the raising of the subject's curtain and ends when the curtain is lowered.

RUN SET - Synonymous with mission.

SLANT RANGE - The diagonal measurement from the Observer's eye position to a particular location on the terrain model, usually a surveyed target location.

SOLAR SIMULATOR - Mobile xenon lamp capable of being positioned to simulate various sun elevations and azimuths.

SUBJECT - An individual, either military or Martin Marietta employee, selected to participate in the experiment by making 4 or 6 acquisition attempts using various means and under various conditions. May be referred to as an Observer.

SURVEYED TARGET LOCATION (STL) - One of nine discrete points on the terrain model from which horizontal range measurements are made. The center tank of the 3-tank arrays will be positioned at these locations. In sub-experiment 2, the center tank of the lead element in the 9-tank array and the single tanks will be placed at these locations. Sub-experiments 1, 2, and 3 use six STL and 4 and 5 use one of the surveyed locations used in sub-experiments 1, 2, and 3 plus three others.

TARGET - In sub-experiments 1, 3, 4, and 5, the target will consist of three M60 tank models of an appropriate scale and coloration, arranged along a northeast-southwest line on the west side of the table and on the east side, a northwest-southeast line at 50 meter intervals and oriented as if proceeding to the southeast on the west side of the table and southwest on the

other side. The center tank of the formation will be on the surveyed target location (STL). In sub-experiment 2, the target will consist of zero, one, three or nine tanks. Single tanks and the center of the three tank formations will be positioned on the STL. Nine-tank formations will have three three-tank elements; each element will be arranged line abreast as indicated above and the three elements will be arranged in a "V" formation with the center tank of the lead element on the STL and the inboard tank of the two rear elements positioned 50 meters to the rear and 50 meters outboard of the outboard tank of the lead element.

TARGET AREA - An area of the terrain model bounded by prebriefed features which define the area to be searched during a single run. In sub-experiments 1, 2, and 3, there are six such areas numbered from south to north and west to east:

N

	III	VI	
W	II	V	E
	I	IV	

S

In sub-experiments 4 and 5 there are four areas, also numbered south to north and west to east:

N

	II	IV	
W	I	III	E

S

TEST CONDUCTOR - The individual with overall control over the laboratory by virtue of having overriding control of all functions. He is stationed in the control room and maintains visual surveillance of the optical room.

UMPIRE - Synonymous with Experimenter.

SEEKVAL EXPERIMENT IB1
PROCEDURE SVIB1-15
SAFETY

NOTE: The following safety procedures are mandatory and will be followed in addition to those prescribed in other operating procedures. A copy of this procedure will be read and initialed by all personnel involved in test conduct.

1. The safety of the Experimental Observers will be paramount in the execution of the experiments and in interpretation of all procedures.

2. During runs, all doors in the optical room except the overhead door and the door to the south lobby will be kept locked. The terrain model will not be moved until the test conductor has verified the doors are locked; the Experimenter and test conductor will maintain surveillance of the two unlocked doors.

3. The overhead door will be raised prior to moving the terrain model to a height just sufficient to clear the highest point on the terrain model as indicated by the index mark on the west door frame.

4. The lateral and vertical drive systems will be turned on only while positioning the habitat, and only one drive system will be on at any given time whenever habitat and/or Experimenter's station is occupied.

5. The beam will never be raised from the floor with occupants in the cockpit and Experimenter's station unless they are in their seats with lap belts and shoulder harnesses secured.

6. The solar simulator vehicle will not be moved nor the boom controls actuated unless someone is stationed to watch for possible hazards. Among the hazards to be particularly guarded against are:

   a. Driving solar simulator vehicle into trenches.

   b. Contact with lights or laboratory structure by any part of the boom.

   c. Running over or snagging lamp power cable.

   d. Moving boom without outrigger or transporter attachment.

7. The solar simulator vehicle parking brake will:

   a. Never be set while attached to the terrain model transporter.

   b. Always be set when unattended and not attached to the terrain model transporter.

8. When attached to the north end of the terrain model, the solar simulator boom must not be moved in azimuth more than 30 degrees from the north-south direction unless the boom is fully retracted.

SEEKVAL EXPERIMENT IB1
PROCEDURE SVIB1-16
RUN SCHEDULING

NOTE: This procedure is to be used on a daily basis after completion of runs.

1. Review completed run records and following day's Observer input schedule.

2. Determine optimum lab utilization plan for the day and list desired runs in the order to be accomplished on Form SVIB1-16A, Daily Run Schedule and Log.

3. Enter desired runs in computer and print out pre-run sheets in duplicate.

4. Place the original in the Experimenter's station and the carbon copy at test conductor's station.

FORM SVIB1-16A
SEEKVAL EXPERIMENT IB1
DAILY RUN SCHEDULE AND LOG

Date ____________________ Sheet _____ of ________________ Released _______________

Sequential Run No.	Search Mode	Run I.D. No.	Time Subject Enters Habitat	Subject	Sun Angle	First Target	Remarks

____
Peter B. Brigham

SEEKVAL EXPERIMENT IB1
PROCEDURE SVIB1-17
LIGHTING ADJUSTMENTS

NOTE: This procedure covers adjustment of light levels and color only. For solar simulator spatial positioning, see Procedure SVIB1-6.

1. OVERHEAD FLUORESCENT LIGHTING - This light source is used to provide a diffuse overhead lighting simulating an overcast sky during all experiments, and at a lower level, skylight when the solar simulator is in use. For overcast sky simulation, all lights will be on to provide maximum lighting for the television system. This level will be measured each day during laboratory verification (Procedure SVIB1-9). The level will be recorded on Form SVIB1-17A only when lamp failure degrades the level below the previous reading and again when lights are replaced. See Steps 3 and 4 for operation as the skylight source.

2. OVERHEAD INCANDESCENT LIGHTING - These lights may be used at a low level to provide additional red light to optimize the television sensor performance. If used, the level will be measured (in the absence of other light) and recorded on Form SVIB1-17A on a one time basis unless the level is changed.

3. SOLAR SIMULATOR - The solar simulator output level is not variable, but can be expected to degrade to about 90 percent of its initial level during the life of the lamp. The level will be measured daily, but recorded only when the ratio of solar simulator to overhead lighting changes sufficiently to require adjustment.

4. SKYLIGHT SIMULATION (Overhead fluorescent) - The overhead light level used to simulate skylight will be about 18 percent to 20 percent of the output of the solar simulator. Since the solar simulator cannot be varied, but may degrade with age, the overhead lighting will have to be varied to provide the desired ratio. Since the fluorescents are switched in 50 foot-candle (at the surface of the model) increments from the control room, and in 50 foot-candle increments (but with different physical separation between lamps) by the circuit breakers, it is possible through various combinations of switches and breakers to set up a variety of uniform lighting levels. Uniform levels for various switching combinations will be established as required. The level selected will be verified by measurement and recorded. Measurements will be checked each day, but recorded only when changes take place.

FORM SVIB1-17A
LIGHTING MEASUREMENTS

Sheet 1 of 1

Date	Overhead Fluorescent			Overhead Incandescent	Solar Simulator		By	Reason For Measurement and Remarks
	High	Low			40° Sun	20° Sun		
		Setup	Level					
12-9-74	500 f.c.	Bay 1 thru 6 50 f.c. each	100 f.c.	Not Used	500 f.c.	500 f.c.	Brigham	Initial Measurement

Subsequent checks of illumination indicated no further lighting adjustments were required.

SEEKVAL EXPERIMENT IB1
PROCEDURE SVIB1-18
SECURITY

NOTE: Although these experiments are unclassified, the Guidance Development Center is a closed area and these security procedures must be followed.

1. Experimental Observers will be escorted at all times while in the GDC.

2. The overhead door will be kept under direct surveillance by an authorized person while open.

3. Visitors to the GDC will be handled in accordance with existing security instructions and the instructions of the laboratory security custodian.

4. Particular care will be exercised by the Experimenters and others escorting personnel that there is no chance of unauthorized observation of door lock combinations.

SEEKVAL EXPERIMENT IB1
PROCEDURE SVIB1-19
HELMET-MOUNTED SIGHT OPERATION

1. Connect helmet before turning power on.

2. Turn power switch to ON.

   a. Bias required light should be lit.

3. Turn Mode Select switch to "Test" and turn up Reticle Display Intensity until subject can see reticle and discrete light satisfactorily. In the "Test" position mode the HMS is outputting +60 degrees Az and 0 degree El.

4. Turn mode select switch to "Normal" and discrete lights will go off and the reticle will stay lit.

   NOTE: Reticle will go out if subject is not in motion box.

5. Turn mode select switch to boresight.

   a. Subject will not be outputting LOS, but the helmet mounted sight (HMS) will be outputting 0 degree Az and 0 degree El.

      NOTE: This is true only if the bias required light is on.

6. Instruct subject to place the HMS reticle over the boresight target and turn the mode select switch to "Bias Store."

   NOTE: Subject must hold mode select switch in "Bias Store" position for 1/2 sec.

7. Turn mode select switch to "Normal" and the HMS is now boresighted and outputting LOS.

8. After completion of HMS operation turn power switch off before disconnecting the helmet.

APPENDIX F

EXPERIMENTER'S LOG AND POST-RUN PRINTOUT SAMPLES

Examples of the Experimenter's log and the post-run printout are presented in the following order:

1 Experimenter Log Sheet remarks codes

2 Sample Experimenter's log sheet for sub-experiments 1 and 3

3 Sample computer printout corresponding to 2 above. [Note - this sample is representative of the "batching" process used with 90 degrees sun azimuth; therefore there are four separate printouts, one for each of the four run sets (targets 1 and 2, target 3, targets 4 and 5, and target 6) made by the sample observer.]

4 Sample Experimenter's log sheet for sub-experiment 2

5 Sample computer printout corresponding to 4 above

6 Sample Experimenter's log sheet for sub-experiment 4

7 Sample computer printout corresponding to 6 above

8 Sample Experimenter's log sheet for sub-experiment 5

9 Sample computer printout corresponding to 8 above.

EXPERIMENTAL LOG SHEET REMARKS CODE

SEEKVAL Post-Run Remarks Code	Fixed Wing Sub-experiments 1, 2, and 3	SEEKVAL Post-Run Remarks Code	Rotary Wing Sub-experiments 4 and 5
1.	Direct Vision - No other comment A. See Data Sheet	1.	Direct Vision - No other comment A. See Data Sheet
2.	HS:TV - No other comment B. See Data Sheet	2.	PC:TV - No other comment B. See Data Sheet
3.	SC:TV - No other comment C. See Data Sheet	3.	SC:TV - No other comment C. See Data Sheet
4.	DV + HS:TV - No other comment D. See Data Sheet	4.	DV + PC:TV - No other comment D. See Data Sheet
5.	DV + SC:TV - No other comment E. See Data Sheet	5.	DV + SC:TV - No other comment E. See Data Sheet
6.	HS:TV + SC:TV - No other comment F. See Data Sheet	6.	PC:TV + SC:TV - No other comment F. See Data Sheet
7.	DV + HS:TV - No other comment G. See Data Sheet	7.	DV + PC:TV + SC:TV - No other comment G. See Data Sheet
		8.	SO - No other comment H. See Data Sheet
		9.	SO + DV - No other comment J. See Data Sheet
			N - Abort (wrong area or inadvertent triggering)
			(Note: A time-out (at 60 sec) is indicated by the appropriate letter symbol with comment on Data Sheet)

COPY

"EXAMPLE" FOR EXPERIMENTS 1 & 3

SEEKVAL IB1 Experimenter's Check Sheet & Manual Log

3

Date 1/15/75 Experimenter Romans Serial No. 153.4

Fixed Wing Experiment No. 1 Name

Run 1144

Table Config. E "Mission" Briefing ✓

Method VF

Sun El 40° Az 90° "Run" Briefing ✓

Alt. 3000 Ft.

Target Color OD Photo Provided ✓

Bkgrd Color GR

Targets per Zone 3

	Runs	CL/CON	No. Tgts Reported Good	Bad	Target Description	Remarks
(1)	.1	HL	3	0	OK	1
(2)	.2	LH	0	1	wrong place	A
(3)	.3	MH	0	1	wrong place	1
(4)	.4	HH	0	0	nothing	4
(5)	.5	LL	3	0	OK	4
(6)	.6	ML	3	0	OK	4

A = No head motion; eye search

Debrief:

Experiment ✓

No Communication ✓

Not back to trailer ✓

Thanks ✓

SERIAL NUMBER	TNG	MODE	TABLE	METHOD	CL/CON	SUN ANGLE EL	SUN ANGLE AZ	ALTITUDE (FEET)	COLOR TGT	COLOR BKGRD	TGTS/ZONE	ACQUISITION DATA RANGE (M)	TARGETS GOOD	TARGETS BAD	TIME (SEC)	R	RUN ID
153.4	U	FW	E	VF	HL	40	90	3000	OD	GR	3	4192	3	0	046.4	1	1144.1
					LH							2888	0	1	053.0	A	1144.2
					MH												1144.3
					HH												1144.4
					LL												1144.5
					ML												1144.6

SEEKVAL IB1 EXPERIMENTER- ROMANS START TIME 13:35 JAN 15,'75

SERIAL NUMBER	TNG	MODE	TABLE	METHOD	CL/CON	SUN ANGLE EL	SUN ANGLE AZ	ALTITUDE (FEET)	COLOR TGT	COLOR BKGRD	TGTS/ZONE	ACQUISITION DATA RANGE (M)	TARGETS GOOD	TARGETS BAD	TIME (SEC)	R	RUN ID
153.4	U	FW	E	VF	HL	40	90	3000	OD	GR	3						1144.1
					LH												1144.2
					MH							4453	0	1	045.3	1	1144.3
					HH												1144.4
					LL												1144.5
					ML												1144.6

SEEKVAL IB1 EXPERIMENTER- ROMANS START TIME 14:42 JAN 15,'75

SERIAL NUMBER	TNG	MODE	TABLE	METHOO	CL/CON	SUN ANGLE EL	SUN ANGLE AZ	ALTITUDE (FEET)	COLOR TBT	COLOR BKGRD	TGTS/ZONE	ACQUISITION DATA RANGE (M)	TARGETS GOOD	TARGETS BAD	TIME (SEC)	R	RUN ID
153.4	U	FW	E	VF	HL	40	90	3000	OD	GR	3						1144.1
					LH												1144.2
					MH												1144.3
					HH							2421	0	0	055.7	4	1144.4
					LL							5290	3	0	038.9	4	1144 5
					ML												1144.6

SEEKVAL IB1 EXPERIMENTER - ROMANS START TIME 15:30 JAN 15,'75

SERIAL NUMBER	TNO	MODE	TABLE	MERHOD	CL/CON	SUN ANGLE EL	SUN ANGLE AZ	ALTITUDE (FEET)	COLOR TGT	COLOR BKGRD	TGTS/ZONE	ACQUISITION DATA RANGE (M)	TARGETS GOOD	TARGETS BAD	TIME (SEC)	R	RUN ID
153.4	U	FW	E	VF	HL	40	90	3000	OD	GR	3						1144.1
					LH												1144.2
					MH												1144.3
					HH												1144.4
					LL												1144.5
					ML							5069	3	0	041.4	4	1144.6

(5)

COPY

"EXAMPLE" FOR EXPERIMENT 2

SEEKVAL IB1 Experimenter's Check Sheet & Manual Log

Date 1/29/75 Experimenter Romans Serial No. 245.3

Fixed Wing Experiment No. 2 Name

Run 2001

Table Config. F "Mission" Briefing ✓

Method DV

Sun El — Az — "Run" Briefing ✓

Alt. 3500 Ft.

Target Color OD Photo Provided ✓

Bkgrd Color GR

Targets per Zone as stated

Runs	CL/CON	Tgts Present	No. Tgts Reported Good	No. Tgts Reported Bad	Target Description	Remarks
(1) .1	ML	0	0	0	OK	1
(2) .2	HL	1	1	0	OK	1
(3) .3	LH	3	3	0	OK	A(1)
(4) .4	MH	1	0	0	Nothing	A(2)
(5) .5	HH	3	0	0	Nothing	A(2)
(6) .6	LL	9	5	0	OK	A(2)

A(1) Little head motion

A(2) Violent head motion

Debrief:

Experiment ✓

No Communication ✓

Not back to trailer ✓

Thanks ✓

SEEKVAL IB1 EXPERIMENTER- ROMANS START TIME 09:53 JAN 29,'75

SERIAL NUMBER	TNG	MODE	TABLE	METHOD	CL/CON	SUN ANGLE EL	SUN ANGLE AZ	ALTITUDE (FEET)	COLOR TGT	COLOR BKRD	TGTS/ZONE	ACQUISITION DATA RANGE (M)	TARGETS GOOD	TARGETS BAD	TIME (SEC)	R	RUN ID
245.3	T	FW	F	DV	ML	90	--	3000	OD	GR	0	1121	0	0	061.6	1	2001.1
					HL						1	2383	1	0	052.3	1	2001.2
					LH						3	5948	3	0	035.2	A	2001.3
					MH						1	1077	0	0	062.5	A	2001.4
					HH						3	1079	0	0	063.1	A	2001.5
					LL						9	6643	5	0	032.4	A	2001.6

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"EXAMPLE" FOR EXPERIMENT 4

5

SEEKVAL IB1 Experimenter's Check Sheet & Manual Log

Date 2/25/75 Experimenter Sears Serial No. 491.3

Rotary Wing Experiment No. 4 Name

Run 4196

Table Config. J "Mission" Briefing ✓

Method SO

Sun El — Az — "Run" Briefing ✓

Alt. 1300 Ft.; Range 4200 m.

Target Color OD Photo Provided ✓

Bkgrd Color GR

Targets per Zone 3

	Runs	CL/CON	No. Tgts Reported Good	Bad	Target Description	Remarks
(1)	.1	MH	3	0		9
(2)	.2	LL	3	0		/
(3)	.3	ML	0	0		N
(4)	.4	LH	3	0		/
(5)						
(6)						

N= Inadvertant trigger

Debrief:

Experiment ✓

No Communication ✓

Not back to trailer ✓

Thanks ✓

SEEKVAL IB1 EXPERIMENTER- SEARS START TIME 09:25 FEB 25,'75

SERIAL NUMBER	TNG	MODE	TABLE	METHOD	CL/CON	SUN ANGLE EL	SUN ANGLE AZ	ALTITUDE (FEET)	COLOR TGT	COLOR BKGRD	TGTS/ZONE	ACQUISITION DATA RANGE (M)	TARGETS GOOD	TARGETS BAD	TIME (SEC)	R	RUN ID
491.3	U	RW	J	SO	MH	90	--	1300	OD	GR	3	4200	3	0	035.6	9	4196.1
					LL							4200	3	0	004.4	1	4196.2
					ML							4200	0	0	004.4	N	4196.3
					LH							4200	3	0	011.5	1	4196.4

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"EXAMPLE" FOR EXPERIMENT 5

(19)

SEEKVAL IB1 Experimenter's Check Sheet & Manual Log

Date 3/4/75 Experimenter Sears Serial No. 585.4

Rotary Wing Experiment No. 5 Name

Run 5065

Table Config. M "Mission" Briefing ✓

Method SO

Sun El — Az — "Run" Briefing ✓

Alt. 800 Ft.; Range 4200 m.

Target Color noted Photo Provided ✓

Bkgrd Color noted

Targets per Zone 3

Runs		CL/Color Tgts	Bkg	No. Tgts Reported Good	Bad	Target Description	Remarks
(1)	.1	M PT	GR	3	0		9
(2)	.2	H PT	BR	3	0		9
(3)	.3	L OD	GR	3	0		1
(4)	.4	M OD	BR	3	0		9
(5)							
(6)							

Debrief:

Experiment ✓

No Communication ✓

Not back to trailer ✓

Thanks ✓

SEEKVAL IB1						EXPERIMENTER- SEARS						START TIME					15:27 MAR 04,'75	
SERIAL NUMBER	TNG	MODE	TABLE	METHOD	CL/CON	SUN ANGLE EL	SUN ANGLE AZ	ALTITUDE (FEET)	COLOR TGT	COLOR BKGRD	TGTS/ ZONE	ACQUISITION DATA RANGE (M)	TARGETS GOOD	TARGETS BAD	TIME (SEC)	R	RUN ID	
585.4	T	RW	M	SO	M	90	--	0800	PT	GR	3	4200	3	0	007.5	9	5065.1	
					H							4200	3	0	008.7	9	5065.2	
					L							4200	3	0	002.4	1	5065.3	
					M							4200	3	0	010.5	9	5065.4	

APPENDIX G

OBSERVER AUDIT

The Observer audit was conducted throughout the course of the IB1 experiments. Names, subject numbers and suffixes, run numbers, and source information were transferred daily from the daily log to the audit form. At intervals of two or three days, subject questionnaires, Experimenter's data sheets, and debriefing questionnaires were audited and appropriate notation made on the audit form to indicate the presence of these data in the files. The audit form column headings and notation are as follows:

Subject Number - Serial number assigned each Observer in reporting order.

Suffix - Decimal portion of subject number. Subjects 001 through 061 had either a .1 or .2 assigned (with the exception of 012 and 013). Military subjects were assigned .1 and Martin Marietta subjects were .2. Subjects 012 and 013 both have a .3 suffix assigned, for 013 to indicate a Martin Marietta employee running as a trained subject; the 012 number was assigned after 18 December 1974 when the .3 suffix indicated no comment. Suffix codes as used subsequent to 18 December 1974 are as follows:

1. and .2 - Not used
.3 - No comment
.4 - Better than 20/20 vision
.5 - Less than 20/20 vision
.6 - Color blind
.7 - Better than 20/20, but color blind
.8 - Less than 20/20, and color blind
.9 - Ill
.0 - Considerable difference between left and right eye

Run - Sequential run number (First digit indicates experiment number).

Source - Observer's organization, i.e., company or service

Subject Questionnaire - A mark in this column indicates that the auditor sighted the questionnaire filled out by this subject.

Experimenter Data Sheet - The last initial of the Experimenter appearing in this column signifies that the auditor has sighted the data sheet and that run and subject numbers agree with other data.

Debriefing Questionnaire - A mark in this column indicates that the auditor has sighted the questionnaire filled out by this subject.

Date - Date subject made his runs

Name - Observer's name - Used only on master audit form (Good experimental practice suggests deletion of subject's names from published documents).

Comments - Self-explanatory

PERSONNEL AUDIT SEEKVAL EXPERIMENT 1

Subject Number	Suffix	Run	Source	Subject Questionnaire	Experimenter Data Sheet	Debriefing Questionnaire	Date	Name	Comments
001	2	1026	CIV	X	R	X	12-9		
002	1	1025	USAF	X	S	X	12-9		
003	1	1027	USAF	X	R	X	12-9		
004	1	1029	USAF	X	S	X	12-9		
005	1	1031	USAF	X	R	X	12-9		
006	2	1028	CIV	S	S	X	12-9		
007	2	1030	CIV	X	R	X	12-9		
008	2	1032	CIV	X	S	X	12-9		
009	2	1002	CIV	X	R	X	12-9		
010	2	1004	CIV	X	S	X	12-9		
011	2	1006	CIV	X	R	X	12-9		
012	3	1154	CIV	X	S	X	1-16		Table E
013	3	1047	CIV	X	S	X	12-9		Ran as trained subject
014	1	1001	USAF	X	R	X	12-10		
015	1	1003	USAF	X	S	X	12-10		
016	1	1005	USAF	X	R	X	12-10		
017	2	1008	CIV	X	S	X	12-10		
018	1	1007	USAF	X	S	X	12-10		
019	1	1009	USN	X	R	X	12-10		
020	1	1013	USN	X	S	X	12-10		
021	1	1011	USN	X	R	X	12-10		
022	2	1010	CIV	X	S	X	12-11		
023	1	1015	USMC	X	R	X	12-11		
024	1	1012	USMC	X	S	X	12-11		Ran as untrained subject

PERSONNEL AUDIT SEEKVAL EXPERIMENT 1

Subject Number	Suffix	Run	Source	Subject Question-naire	Experimenter Data Sheet	Debriefing Question-naire	Date	Name	Comments
025	2	1014	CIV	X	S	X	12-11		
026	1	1017	USAF	X	R	X	12-12		
027	1	1016	USAF	X	S	X	12-12		Ran as untrained subject.
028	1	019	USAF	X	R	X	12-12		
029	1	1021	USAF	X	S	X	12-12		
030	2	1023	CIV	X	R	X	12-12		Ran as trained subject.
031	2	1018	CIV	X	S	X	12-12		
032	2	1020	CIV	X	R	X	12-12		
033	2	1022	CIV	X	S	X	12-12		
034	2	1024	CIV	X	R	X	12-12		
035	2	1034	CIV	X	S	X	12-13		
036	1	1033	USAF	X	R	X	12-13		
037	1	1035	USAF	X	S	X	12-13		
038	1	1039	USAF	X	S	X	12-13		
039	1	1037	USAF	X	R	X	12-13		
040	1	1057	USN	X	R	X	12-13		
041	1	1059	USN	X	S	X	12-13		
042	1	1061	USN	X	R	X	12-13		
043	2	1036	CIV	X	S	X	12-16		
044	1	1055	USMC	X	R	X	12-16		
045	1	1063	USMC	X	R	X	12-16		
046	2	1058	CIV	X	S	X	12-16		
047	2	1050	CIV	X	S	X	12-16		
048	2	1052	CIV	X	R	X	12-16		

PERSONNEL AUDIT SEEKVAL EXPERIMENT 1

Subject Number	Suffix	Run	Source	Subject Questionnaire	Experimenter Data Sheet	Debriefing Questionnaire	Date	Name	Comments
049	2	1054	CIV	X	S	X	12-16		
050	2	1056	CIV	X	R	X	12-16		
051	2	1060	CIV	X	S	X	12-16		
052	2	1062	CIV	X	R	X	12-16		
053	2	1042	CIV	X	S	X	12-17		
054	2	1044	CIV	X	R	X	12-18		
055	2	1046	CIV	X	S		12-17		
056	1	1049	USN	X	R	X	12-17		
057	1	1041	USN	X	S	X	12-17		
058	1	1051	USAF	X	S	X	12-18		
059	1	1053	USAF	X	R	X	12-18		
060	1	1043	USAF	X	S	X	12-18		
061	1	1045	USAF	X	R	X	12-18		
062	3	1038	CIV	X	R	X	12-19		
063	3	1048	CIV	X	R	X	12-19		
064	3	1064	CIV	X	S	X	12-19		
065	3	1040	CIV	X	R	X	12-19		
066	4	1066	CIV	X	R	X	1-6		
067	4	1068	CIV	X	R	X	1-6		
068	4	1070	CIV	X	R	X	1-6		
069	3	1072	CIV	X	R	X	1-6		
070	3	1082	CIV	X	R	X	1-6		
071	3	1084	CIV	X	R	X	1-6		
072	3	1086	CIV	X	R	X	1-6		

PERSONNEL AUDIT SEEKVAL EXPERIMENT 1

Subject Number	Suffix	Run	Source	Subject Questionnaire	Experimenter Data Sheet	Debriefing Questionnaire	Date	Name	Comments
073	4	1081	USAF	X	R	X	1-6		
074	4	1065	USN	X	S	X	1-6		
075	4	1067	USMC	X	S	X	1-6		
076	4	1069	USN	X	S	X	1-6		
077	3	1071	USN	X	S	X	1-6		
078	4	1089	USAF	X	S	X	1-6		
079	4	1091	USAF	X	S	X	1-6		
080	4	1093	USAF	X	S	X	1-6		
081	3	1095	USAF	X	S	X	1-6		
082	3	1090	CIV	X	S	X	1-6		
083	4	1073	USAF	X	S	X	1-7		
084	3	1083	USMC	X	R	X	1-7		
085	4	1085	USAF	X	R	X	1-7		
086	3	1087	USAF	X	R	X	1-7		
087	3	1074	CIV	X	R	X	1-7		
088	3	1076	CIV	X	R	X	1-7		
089	3	1078	CIV	X	R	X	1-7		
090	3	1080	CIV	X	R	X	1-7		
091	4	1075	USAF	X	S	X	1-7		
092	4	1077	USN	X	S	X	1-7		
093	3	1079	USN	X	S	X	1-7		
094	4	1092	CIV	X	S	X	1-8		
095	3	1094	CIV	X	R	X	1-8		
096	3	1096	CIV	X	S	X	1-8		
097	3	1088	CIV	X	R	X	1-7		

PERSONNEL AUDIT SEEKVAL EXPERIMENT 1

Subject Number	Suffix	Run	Source	Subject Questionnaire	Experimenter Data Sheet	Debriefing Questionnaire	Date	Name	Comments
098	3	1100	CIV	X	R	X	1-9		
099	3	1102	CIV	X	R	X	1-9		
100	4	1104	CIV	X	R	X	1-9		
101	4	1114	CIV	X	R	X	1-9		
102	3	1116	CIV	X	R	X	1-9		
103	3	1118	CIV	X	R	X	1-9		
104	4	1113	USMC	X	R	X	1-9		
105	3	1097	USAF	X	S	X	1-9		
106	3	1099	USN	X	S	X	1-9		
107	3	1101	USN	X	S	X	1-9		
108	4	1103	USN	X	S	X	1-9		
109	4	1098	CIV	X	R	X	1-9		
110	4	1122	CIV	X	S	X	1-9		
111	3	1121	USAF	X	S	X	1-9		
112	3	1123	USAF	X	S	X	1-9		
113	4	1125	USAF	X	S	X	1-9		
114	5	1127	USAF	X	S	X	1-9		
115	4	1115	USAF	X	R	X	1-10		
116	3	1120	CIV	X	R	X	1-10		
117	4	1117	USAF	X	R	X	1-10		
118	3	1119	USMC	X	R	X	1-10		
119	5	1106	CIV	X	R	X	1-10		
120	7	1108	CIV	X	R	X	1-10		

PERSONNEL AUDIT SEEKVAL EXPERIMENT 1

Subject Number	Suffix	Run	Source	Subject Question-naire	Experimenter Data Sheet	Debriefing Question-naire	Date	Name	Comments
121	3	1110	CIV	X	R	X	1-10		
122	4	1112	CIV	X	R	X	1-10		
123	3	1105	USN	X	S	X	1-10		
124	4	1107	USN	X	S	X	1-10		
125	4	1109	USN	X	S	X	1-10		
126	3	1111	USAF	X	S	X	1-10		
127	3	1124	CIV	X	S	X	1-13		
128	3	1126	CIV	X	R	X	1-13		
129	4	1125	CIV	X	S	X	1-13		
130	3	1132	CIV	X	R	X	1-14		
131	7	1134	CIV	X	R	X	1-14		
132	3	1136	CIV	X	R	X	1-14		
133	3	1146	CIV	X	R/S	X	1-14		
134	7	1145	USMC	X	R	X	1-14		See Subject No.012.3
135	3	1148	CIV	X	R/S	X	1-14		
136	3	1150	CIV	X	R/S	X	1-14		
137	3	1130	CIV	X	R	X	1-14		
138	3	1129	USN	X	S	X	1-14		
139	4	1131	USN	X	S	X	1-14		
140	4	1133	USN	X	S	X	1-14		
141	4	1135	USAF	X	S	X	1-14		
142	5	1153	USAF	X	S	X	1-14		
143	7	1155	USAF	X	S	X	1-14		
144	4	1157	USAF	X	S	X	1-14		
145	3	1159	USAF	X	S	X	1-14		

PERSONNEL AUDIT SEEKVAL EXPERIMENT 1

Subject Number	Suffix	Run	Source	Subject Question-naire	Experimenter Data Sheet	Debriefing Question-naire	Date	Name	Comments
146	4	1147	USMC	X	R	X	1-15		
147	5	1149	USMC	X	R	X	1-15		
148	3	1151	USAF	X	R	X	1-15		
149	3	1152	CIV	X	R	X	1-15		
150	4	1138	CIV	X	R	X	1-15		
151	3	1140	CIV	X	R	X	1-15		
152	3	1142	CIV	X	R	X	1-15		
153	4	1144	CIV	X	R	X	1-15		
154	3	1137	USN	X	S	X	1-15		
155	3	1139	USN	X	S	X	1-15		
156	4	1141	USAF	X	S	X	1-15		
157	4	1143	USAF	X	S	X	1-15		
158	3	1156	CIV	X	S	X	1-16		
159	3	1158	CIV	X	S	X	1-16		
160	3	1160	CIV	X	S	X	1-16		
161	3	1162	CIV	X	S	X	1-17		
162	3	1166	CIV	X	S	X	1-17		
163	3	1164	CIV	X	S	X	1-17		
164	3	1168	CIV	X	S	X	1-17		
165	3	1178	CIV	X	S	X	1-17		
166	3	1180	CIV	X	S	X	1-17		
167	3	1182	CIV	X	S	X	1-17		
168	4	1177	USMC	X	S	X	1-17		
169	3	1161	USN	X	S	X	1-17		
170	4	1163	USN	X	S	X	1-17		

PERSONNEL AUDIT SEEKVAL EXPERIMENT 1

Subject Number	Suffix	Run	Source	Subject Question-naire	Experimenter Data Sheet	Debriefing Question-naire	Date	Name	Comments
171	3	1165	USN	X	S	X	1-17		
172	4	1167	USAF	X	S	X	1-17		
173	6	1186	CIV	X	S	X	1-17		
174	7	1185	USAF	X	S	X	1-17		
175	3	1187	USAF	X	S	X	1-17		
176	3	1189	USAF	X	S	X	1-17		
177	3	1191	USAF	X	S	X	1-17		
178	4	1179	USAF	X	R	X	1-20		
179	4	1181	USAF	X	R	X	1-20		
180	3	1183	USAF	X	R	X	1-20		
181	4	1184	CIV	X	R	X	1-20		
182	3	1170	CIV	X	R	X	1-20		
183	3	1172	CIV	X	R	X	1-20		
184	3	1174	CIV	X	R	X	1-20		
185	4	1176	CIV	X	R	X	1-20		
186	3	1169	USN	X	S	X	1-20		
187	3	1171	USN	X	S	X	1-20		
188	3	1173	USN	X	S	X	1-20		
189	3	1175	USN	X	S	X	1-20		
190	3	1188	CIV	X	S	X	1-21		
191	3	1190	CIV	X	S	X	1-21		
192	3	1192	CIV	X	S	X	1-21		
									USAF - 53
									USMC - 12
									USN - 31
									MMA - 96

PERSONNEL AUDIT SEEKVAL EXPERIMENT 3

Subject Number	Suffix	Run	Source	Subject Questionnaire	Experimenter Data Sheet	Debriefing Questionnaire	Date	Name	Comments
193	3	3050	CIV	X	R	X	1-22		
194	3	3052	CIV	X	R	X	1-22		
195	3	3054	CIV	X	R	X	1-22		
196	3	3056	CIV	X	R	X	1-22		
197	3	3034	CIV	X	R	X	1-22		
198	3	3036	CIV	X	R	X	1-22		
199	3	3038	CIV	X	R	X	1-22		
200	3	3040	CIV	X	R	X	1-22		
201	3	3049	USN	X	S	X	1-22		
202	4	3051	USN	X	S	X	1-22		
203	3	3053	USAF	X	S	X	1-22		
204	4	3055	USAF	X	S	X	1-22		
205	4	3033	USAF	X	S	X	1-22		
206	4	3035	USAF	X	S	X	1-22		
207	3	3037	USMC	X	S	X	1-22		
208	3	3039	USMC	X	S	X	1-22		
209	3	3025	USAF	X	R	X	1-23		
210	4	3027	USAF	X	R	X	1-23		
211	3	3029	USMC	X	R	X	1-23		
212	3	3031	USMC	X	R	X	1-23		
213	3	3026	CIV	X	S	X	1-23		
214	3	3028	CIV	X	S	X	1-23		
215	3	3030	CIV	X	S	X	1-23		
216	4	3032	CIV	X	X	X	1-23		First 3 runs only

PERSONNEL AUDIT SEEKVAL EXPERIMENT 3

Subject Number	Suffix	Run	Source	Subject Question-naire	Experimenter Data Sheet	Debriefing Question-naire	Date	Name	Comments
217	3	3018	CIV	X	S	X	1-23		
218	3	3020	*	X	S	X	1-23		*French
219	3	3017	USN	X	S	X	1-23		
220	3	3019	USN	X	S	X	1-23		
221	3	3022	CIV	X	R	X	1-24		
222	3	3024	CIV	X	R	X	1-24		
223	4	3021	USN	X	R	X	1-24		
224	3	3023	USAF	X	R	X	1-24		
225	4	3001	USMC	X	R	X	1-27		
226	3	3003	USN	X	R	X	1-27		
227	3	3005	USAF	X	R	X	1-27		
228	3	3007	USAF	X	R	X	1-27		
229	4	3002	CIV	X	S	X	1-27		
230	3	3004	CIV	X	S		1-27		
231	4	3006	CIV	X	S	X	1-27		
232	4	3008	CIV	X	S	X	1-27		
233	3	3010	CIV	X	R	X	1-28		
234	3	3012	CIV	X	R	X	1-28		
235	4	3014	CIV	X	R	X	1-28		
236	3	3016	CIV	X	R	X	1-28		USAF - 12
237	3	3009	USN	X	S	X	1-28		USMC - 5
238	3	3011	USAF	X	S	X	1-28		USN - 7
239	4	3013	USAF	X	S	X	1-28		MMA - 23
240	3	3015	USAF	X	X	X	1-28		French Civ. 1

PERSONNEL AUDIT SEEKVAL EXPERIMENT 2

Subject Number	Suffix	Run	Source	Subject Question-naire	Experimenter Data Sheet	Debriefing Question-naire	Date	Name	Comments
241	6	2002	CIV	X	S	X	1-29		
242	4	2004	CIV	X	R	X	1-29		
243	3	2006	CIV	X	S	X	1-29		
244	3	2008	CIV	X	S	X	1-29		
245	3	2001	USMC	X	R	X	1-29		
246	4	2003	USN	X	R	X	1-29		
247	4	2005	USN	X	S	X	1-29		
248	3	2007	USN	X	R	X	1-29		
249	3	2010	CIV	X	S	X	1-30		
250	3	2012	CIV	X	S	X	1-30		
251	4	2014	CIV	X	R	X	1-30		
252	5	2016	CIV	X	S	X	1-30		
253	3	2009	USAF	X	R	X	1-30		
254	0	2011	USN	X	R	X	1-30		
255	3	2013	USN	X	S	X	1-30		
256	3	2015	USAF	X	R	X	1-30		
257	3	2018	DCASO	X	S	X	1-31		
258	3	2020	CIV	X	R	X	1-31		
259	3	2022	DCASO	X	R	X	1-31		
260	3	2024	CIV	X	S	X	1-31		
261	3	2023	USAF	X	S	X	1-31		
262	4	2017	USN	X	R	X	1-31		
263	4	2019	USN	X	S	X	1-31		
264	4	2021	USN	X	R	X	1-31		
265	3	2026	CIV	X	S	X	2-3		

PERSONNEL AUDIT SEEKVAL EXPERIMENT 2

Subject Number	Suffix	Run	Source	Subject Question-naire	Experimenter Data Sheet	Debriefing Question-naire	Date	Name	Comments
266	3	2028	DCASO	X	R	X	2-3		
267	3	2030	CIV	X	S	X	2-3		
268	3	2032	CIV	X	R	X	2-3		Marginal 20:20
269	3	2025	USAF	X	S	X	2-3		
270	4	2027	USAF	X	R	X	2-3		
271	4	2029	USN	X	S	X	2-3		
272	4	2031	USN	X	R	X	2-3		
									MMA - 16
									USAF - 5
									USN - 10
									USMC - 1

PERSONNEL AUDIT SEEKVAL EXPERIMENT 4

Subject Number	Suffix	Run	Source	Subject Question-naire	Experimenter Data Sheet	Debriefing Question-naire	Date	Name	Comments
301	4	4002	CIV	x	R	X	2/10		
302	3	4004	CIV	X	R	X	2/10		Marginal 20:20
303	3	4006	CIV	X	R	X	2/10		
304	3	4008	CIV	x	R	X	2/10		
305	4	4010	CIV	X	R	X	2/10		
306	4	4012	CIV	X	R	X	2/10		
307	3	4014	CIV	X	R	X	2/10		
308	4	4016	CIV	X	R	X	2/10		
309	4	4018	CIV	X	R	X	2/10		
310	4	4020	CIV	X	R	X	2/10		
311	3	4022	CIV	X	R	X	2/10		Left eye slightly under 20:20
312	4	4024	CIV	X	R	X	2/10		
313	0	4001	USA	X	S	X	2/10		
314	4	4003	USA	X	S	X	2/10		
315	3	4005	USA	X	S	X	2/10		
316	4	4007	USA	X	S	X	2/10		
317	4	4009	USA	X	S	X	2/10		
318	3	4011	USA	X	S	X	2/10		
319	3	4013	USA	X	S	X	2/10		
320	4	4015	USA	X	S	X	2/10		
321	4	4017	USMC	X	S	X	2/10		
322	4	4019	USMC	X	S	X	2/10		
323	4	4021	USMC	X	S	X	2/10		
324	4	4023	USMC	X	S	X	2/10		

PERSONNEL AUDIT SEEKVAL EXPERIMENT 4

Subject Number	Suffix	Run	Source	Subject Questionnaire	Experimenter Data Sheet	Debriefing Questionnaire	Date	Name	Comments
325	4	4026	CIV	X	R	X	2/11		
326	3	4028	CIV	X	R	X	2/11		
327	3	4030	CIV	X	R	X	2/11		
328	3	4032	CIV	X	R	X	2/11		
329	3	4034	CIV	X	R	X	2/11		
330	3	4036	CIV	X	R	X	2/11		
331	4	4038	CIV	X	R	X	2/11		
332	4	4040	CIV	X	R	X	2/11		
333	3	4042	CIV	X	R	X	2/11		
334	3	4044	CIV	X	R	X	2/11		Left eye marginal 20:20
335	3	4046	CIV	X	R	X	2/11		Left eye slightly under 20:20
336	3	4048	CIV	X	R	X	2/11		
337	4	4025	USA	X	S	X	2/11		
338	3	4027	USA	X	R	X	2/11		
339	4	4029	USA	X	S	X	2/11		
340	3	4031	USA	X	R	X	2/11		
341	4	4033	USA	X	S	X	2/11		
342	4	4035	USA	X	R	X	2/11		
343	4	4037	USA	X	S	X	2/11		
344	3	4039	USA	X	R	X	2/11		
345	4	4041	USMC	X	S	X	2/11		
346	4	4043	USMC	X	R	X	2/11		
347	4	4045	USMC	X	S	X	2/11		
348	3	4047	USMC	X	R	X	2/11		

PERSONNEL AUDIT SEEKVAL EXPERIMENT 4

Subject Number	Suffix	Run	Source	Subject Question-naire	Experimenter Data Sheet	Debriefing Question-naire	Date	Name	Comments
									For Run No. 4050 see Subject No. 403.4
349	3	4052	CIV	X	R	X	2/12		Left eye marginal 20:20
350	3	4054	CIV	X	S	X	2/12		
351	3	4049	CIV	X	R	X	2/12		Subs for USA - Also ran as 012.3
352	3	4051	CIV	X	S	X	2/12		Subs for USA
353	6	4053	CIV	X	R	X	2/12		Subs for USA, slightly color blind
									End of Board G, Begin I
354	0	4110	CIV	X	R	X	2/13		
355	3	4112	CIV	X	S	X	2/13		
356	3	4114	CIV	X	R	X	2/13		
357	3	4116	CIV	X	S	X	2/13		
358	3	4118	CIV	X	R	X	2/13		
359	3	4120	CIV	X	S	X	2/13		
360	3	4122	CIV	X	R	X	2/13		
361	3	4124	CIV	X	S	X	2/13		Left eye marginal 20:20
362	3	4126	CIV	X	R	X	2/13		
363	3	4128	CIV	X	S	X	2/13		
364	3	4130	CIV	X	R	X	2/13		
365	3	4132	CIV	X	S	X	2/13		Marginal 20:20
366	3	4109	USA	X	R	X	2/13		
367	3	4111	USA	X	S	X	2/13		
368	3	4113	USA	X	R	X	2/13		Right eye under 20:20

PERSONNEL AUDIT SEEKVAL EXPERIMENT 4

Subject Number	Suffix	Run	Source	Subject Question-naire	Experimenter Data Sheet	Debriefing Question-naire	Date	Name	Comments
369	3	4115	USA	X	S	X	2/13		Right eye under 20:20
370	3	4117	USA	X	R	X	2/13		Left eye under 20:20
371	3	4119	USA	X	S	X	2/13		
372	3	4121	USA	X	R	X	2/13		
373	4	4123	USA	X	S	X	2/13		
374	0	4125	USMC	X	R	X	2/13		
375	4	4127	USMC	X	S	X	2/13		
376	4	4129	USMC	X	R	X	2/13		
377	4	4131	USMC	X	S	X	2/13		
378	0	4134	DCASO	Z	S	X	2/14		
379	3	4136	CIV	X	R	X	2/14		Marginal 20:20
380	3	4138	CIV	X	S	X	2/14		Left eye slightly under 20:20
381	3	4140	CIV	X	R	X	2/14		Right eye slightly under 20:20
382	3	4142	DCASO	X	S	X	2/14		Slightly color blind
383	4	4144	CIV	X	R	X	2/14		
384	3	4146	CIV	X	S	X	2/14		
385	3	4148	CIV	X	R	X	2/14		Left eye slightly under 20:20
386	3	4150	DCASO	X	S	X	2/14		Left eye slightly under 20:20
387	4	4152	DCASO	X	R	X	2/14		
388	4	4154	DCASO	X	S	X	2/14		
389	4	4156	DCASO	X	R	X	2/14		

PERSONNEL AUDIT SEEKVAL EXPERIMENT 4

Subject Number	Suffix	Run	Source	Subject Question-naire	Experimenter Data Sheet	Debriefing Question-naire	Date	Name	Comments
390	4	4133	USA	X	S	X	2/14		
391	4	4135	USA	X	R	X	2/14		
392	4	4137	USA	X	S	X	2/14		
393	3	4139	USA	X	R	X	2/14		
394	3	4141	USA	X	S	X	2/14		
395	3	4143	USA	X	R	X	2/14		
396	4	4145	USA	X	S	X	2/14		
397	0	4147	USA	X	R	X	2/14		
398	0	4149	USMC	X	S	X	2/14		
399	3	4151	USMC	X	R	X	2/14		
401	3	4153	USMC	X	S	X	2/14		
402	0	4155	USMC	X	R	X	2/14		
403	4	4050	CIV	X	S	X	2/12		See Feb.12
404	3	4160	CIV	X	R	X	2/18		Slightly color blinc
405	3	4158	CIV	X	R	X	2/18		Fem
406	3	4162	CIV	X	R	X	2/18		Left eye marginal 20:20
407	4	4157	USMC	X	S	X	2/18		
408	4	4159	CIV	X	S	X	2/18		Subs for USA Also ran as 050.2 Slightly color blinc
409	0	4161	CIV	X	S	X	2/18		Sub for USA End Board I, Begin H
410	3	4056	CIV	X	S	X	2/19		
411	4	4058	CIV	X	R	X	2/19		
412	4	4060	High Sch. Intern	X	S	X	2/19		

PERSONNEL AUDIT SEEKVAL EXPERIMENT 4

Subject Number	Suffix	Run	Source	Subject Question-naire	Experimenter Data Sheet	Debriefing Question-naire	Date	Name	Comments
413	3	4062	High Sch Intern	X	S	X	2/19		Slightly color blind.
414	3	4064	CIV	X	S	X	2/19		Marginal 20:20
415	4	4066	CIV	X	R	X	2/19		Slightly color blind.
416	3	4068	CIV	X	S	X	2/19		
417	4	4070	CIV	X	R	X	2/19		
418	3	4072	CIV *	X	S	X	2/19		*CIV from M.I.T. Left eye slightly under 20:20
419	3	4074	CIV	X	R	X	2/19		
420	3	4076	CIV	X	S	X	2/19		
421	3	4078	CIV	X	R	X	2/10		
422	4	4080	DCASO	X	S	X	2/19		
423	4	4082	DCASO	X	R	X	2/19		
424	3	4084	CIV	X	S	X	2/19		Left eye marginal 20:20
425	3	4086	CIV	X	R	X	2/19		
426	4	4088	CIV	X	R	X	2/19		
427	3	4090	CIV	X	R	X	2/19		Left eye marginal 20:20. Slightly color blind.
428	3	4092	DCASO	X	S	X	2/19		Left eye marginal 20:20
429	3	4094	DCASO	X	R	X	2/19		Left eye slightly under 20:20. Slightly color blind.

PERSONNEL AUDIT SEEKVAL EXPERIMENT 4

Subject Number	Suffix	Run	Source	Subject Questionnaire	Experimenter Data Sheet	Debriefing Questionnaire	Date	Name	Comments
430	4	4071	USMC	X	S	X	2/19		
431	4	4073	USMC	X	R	X	2/19		
432	3	4075	USMC	X	S	X	2/19		
433	0	4077	USMC	X	R	X	2/19		
434	4	4096	CIV	X	S	X	2/20		
435	3	4098	DCASO	X	R	X	2/20		Left eye marginal 20:20
436	4	4100	CIV	X	S	X	2/20		
437	3	4055	USA	X	S	X	2/20		Left eye marginal 20:20
438	4	4057	USA	X	R	X	2/20		
439	4	4059	USA	X	S	X	2/20		
440	4	4061	USA	X	R	X	2/20		
441	4	4063	USA	X	S	X	2/20		
442	3	4065	USA	X	R	X	2/20		
443	0	4067	USA	X	S	X	2/20		
444	4	4069	USA	X	R	X	2/20		
445	3	4102	CIV	X	R	X	2/20		
446	0	4095	USMC	X	S	X	2/20		
447	4	4097	USMC	X	R	X	2/20		
448	3	4099	USMC	X	S	X	2/20		
449	3	4101	USMC	X	R	X	2/20		
450	3	4079	USA	X	S	X	2/20		
451	3	4081	USA	X	R	X	2/20		
452	4	4083	USA	X	S	X	2/20		

PERSONNEL AUDIT SEEKVAL EXPERIMENT 4

Subject Number	Suffix	Run	Source	Subject Questionnaire	Experimenter Data Sheet	Debriefing Questionnaire	Date	Name	Comments
453	3	4085	USA	X	R	X	2/20		
454	4	4087	USA	X	S	X	2/20		
455	4	4089	USA	X	R	X	2/20		
456	4	4091	USA	X	S	X	2/20		
457	4	4093	CIV	X	R	X	2/20		Subs for USA
458	3	4104	CIV	X	S	X	2/21		
459	4	4106	CIV	X	R	X	2/21		
460	3	4108	CIV	X	S	X	2/21		Marginal 20:20; Slightly color blind.
461	0	4105	USA	X	S	X	2/21		
462	3	4107	USA	X	R	X	2/21		
463	3	4103	CIV	X	R	X	2/21		Subs for USMC also ran as 199.3 Begin Board J
464	0	4164	CIV	X	S	X	2/24		
465	3	4166	CIV	X	R	X	2/24		
466	3	4168	CIV	X	S	X	2/24		
467	3	4170	CIV	X	R	X	2/24		
468	0	4172	CIV	X	S	X	2/24		
469	4	4174	CIV	X	R	X	2/24		
470	4	4176	CIV	X	S	X	2/24		
471	3	4178	CIV	X	R	X	2/24		Right eye marginal
472	3	4180	CIV	X	S	X	2/24		
473	4	4182	CIV	X	R	X	2/24		
474	3	4184	CIV	X	S	X	2/24		Martinal 29"20

PERSONNEL AUDIT SEEKVAL EXPERIMENT 4

Subject Number	Suffix	Run	Source	Subject Question-naire	Experimenter Data Sheet	Debriefing Question-naire	Date	Name	Comments
475	3	4186	CIV	X	R	X	2/24		
476	3	4163	USA	X	S	X	2/24		
477	4	4165	USA	X	R	X	2/24		
478	3	4167	USA	X	S	X	2/24		
479	4	4169	USA	X	R	X	2/24		
480	4	4171	USA	X	S	X	2/24		
481	4	4173	USA	X	R	X	2/24		
482	4	4175	USA	X	S	X	2/24		
483	4	4177	USA	X	R	X	2/24		
484	4	4179	USMC	X	S	X	2/24		
485	3	4181	USMC	X	R	X	2/24		
486	4	4183	USMC	X	S	X	2/24		
487	3	4188	CIV	X	S	X	2/25		Left eye marginal
488	3	4190	CIV	X	R	X	2/25		
489	3	4192	CIV	X	S	X	2/25		
490	3	4194	DCASO	X	R	X	2/25		
491	3	4196	CIV	X	S	X	2/25		
492	3	4198	CIV	X	R	X	2/25		
493	4	4200	CIV	X	S	X	2/25		
494	4	4202	CIV	X	R	X	2/25		
495	4	4204	CIV	X	S	X	2/25		
496	0	4206	CIV	X	R	X	2/25		
497	4	4208	CIV	X	S	X	2/25		
498	3	4210	CIV	X	R	X	2/25		
499	4	4187	USA	X	S	X	2/25		

PERSONNEL AUDIT SEEKVAL EXPERIMENT 4

Subject Number	Suffix	Run	Source	Subject Questionnaire	Experimenter Data Sheet	Debriefing Questionnaire	Date	Name	Comments
501	4	4189	USA	X	R	X	2/25		
502	4	4191	USA	X	S	X	2/25		
503	5	4193	USA	X	R	X	2/25		
504	3	4195	USA	X	S	X	2/25		
505	4	4197	USA	X	R	X	2/25		
506	4	4199	CIV	X	S	X	2/25		Subs for USA Also ran as 030.1
507	7	4201	CIV	X	R	X	2/25		Subs for USA
508	3	4203	USMC	X	S	X	2/25		
509	3	4205	USMC	X	R	X	2/25		Right eye under 20:20
510	3	4027	USMC	X	S	X	2/25		
511	4	4209	USMC	X	R	X	2/25		
512	5	4185	USMC	X	S	X	2/25		
513	0	4212	CIV	X	S	X	2/26		
514	3	4214	CIV	X	R	X	2/26		Marginal 20:20
515	3	4216	CIV	X	S	X	2/26		Right eye slightly under 20:20
516	0	4211	USMC	X	R	X	2/26		
517	3	4213	USA	X	S	X	2/26		
518	0	4215	USA	X	R	X	2/26		End Board J.

PERSONNEL AUDIT SEEKVAL EXPERIMENT 5

Subject Number	Suffix	Run	Source	Subject Questionnaire	Experimenter Data Sheet	Debriefing Questionnaire	Date	Name	Comments
519	0	5002	CIV	X	S	X	2/27		Begin Board K
520	3	5004	CIV	X	R	X	2/27		Left eye slightly under 20:20
521	3	5006	CIV	X	S	X	2/27		
522	3	5008	CIV	X	R	X	2/27		Slightly color blind
523	0	5010	CIV	X	S	X	2/27		
524	0	5012	CIV	X	R	X	2/27		
525	4	5014	CIV	X	S	X	2/27		
526	4	5016	CIV	X	R	X	2/27		
527	3	5018	CIV	X	S	X	2/27		
528	3	5020	CIV	X	R	X	2/27		
529	4	5022	CIV	X	S	X	2/27		
530	3	5024	CIV	X	R	X	2/27		
531	3	5001	USA	X	S	X	2/27		
532	4	5003	USA	X	R	X	2/27		
533	3	5005	USA	X	S	X	2/27		
534	4	5007	USA	X	R	X	2/27		
535	4	5009	USA	X	S	X	2/27		
536	4	5011	USA	X	R	X	2/27		
537	3	5013	USA	X	S	X	2/27		
538	4	5015	USA	X	R	X	2/27		
539	4	5017	USMC	X	S	X	2/27		
540	4	5019	USMC	X	R	X	2/27		

PERSONNEL AUDIT SEEKVAL EXPERIMENT 5

Subject Number	Suffix	Run	Source	Subject Question-naire	Experimenter Data Sheet	Debriefing Question-naire	Date	Name	Comments
541	4	5021	USMC	X	S	X	2/27		
542	4	5023	USMC	X	R	X	2/27		End Board K, Begin L
543	4	5026	CIV	X	S	X	2/28		
544	3	5028	CIV	X	S	X	2/28		
545	4	5030	CIV	X	S	X	2/28		
546	3	5032	CIV	X	R	X	2/28		
547	3	5034	CIV	X	S	X	2/28		Marginal 20:20
548	4	5036	CIV	X	S	X	2/28		
549	4	5025	USA	X	S	X	2/28		
550	3	5027	USA	X	R	X	2/28		
551	4	5029	USA	X	S	X	2/28		
552	0	5031	USA	X	R	X	2/28		
553	4	5033	USMC	X	S	X	2/28		
554	4	5035	USMC	X	R	X	2/28		
555	4	5038	CIV	X	S	X	3/3		
556	4	5040	CIV	X	S	X	3/3		
557	3	5042	CIV	X	S	X	3/3		

PERSONNEL AUDIT SEEKVAL EXPERIMENT 5

Subject Number	Suffix	Run	Source	Subject Question-naire	Experimenter Data Sheet	Debriefing Question-naire	Date	Name	Comments
558	3	5044	CIV	X	R	X	3/3		
559	4	5046	CIV	X	S	X	3/3		
560	0	5048	CIV	X	R	X	3/3		
561	4	5037	USA	X	S	X	3/3		
562	4	5039	USA	X	R	X	3/3		
563	3	5041	USA	X	S	X	3/3		
564	3	5043	USA	X	R	X	3/3		
565	4	5045	USMC	X	S	X	3/3		
566	4	5047	USMC	X	R	X	3/3		
									End Board L, Begin M
567	3	5050	CIV	X	Moya	X	3/4		
568	3	5052	CIV	X	R	X	3/4		
569	4	5054	CIV	X	S	X	3/4		
570	3	5056	CIV	X	R	X	3/4		
571	3	5058	CIV	X	S	X	3/4		
572	3	5060	CIV	X	R	X	3/4		
573	3	5062	CIV	X	S	X	3/4		
574	3	5064	CIV	X	R	X	3/4		Slightly color blind
575	4	5066	CIV	X	S	X	3/4		
576	3	5068	CIV	X	R	X	3/4		
577	4	5049	USA	X	S	X	3/4		
578	4	5051	USA	X	R	X	3/4		
579	4	5053	USA	X	S	X	3/4		
580	4	5055	USA	X	R	X	3/4		

PERSONNEL AUDIT SEEKVAL EXPERIMENT 5

Subject Number	Suffix	Run	Source	Subject Question-naire	Experimenter Data Sheet	Debriefing Question-naire	Date	Name	Comments
581	4	5057	USA	X	S	X	3/4		
582	4	5059	USA	X	R	X	3/4		
583	4	5061	USMC	X	S	X	3/4		
584	4	5063	USMC	X	R	X	3/4		
585	4	5065	USMC	X	S	X	3/5		
586	4	5067	USMC	X	S	X	3/5		
587	4	5069	USMC	X	R	X	3/5		
588	3	5070	CIV	X	S	X	3/5		
589	4	5072	CIV	X	R	X	3/5		
590	4	5071	USA	X	R	X	3/5		
									End Board M, Begin N
591	3	5073	USA	X	R	X	3/5		
592	4	5075	USA	X	S	X	3/5		
593	4	5077	USA	X	R	X	3/5		
594	4	5079	USA	X	S	X	3/5		
595	4	5081	USA	X	R	X	3/5		
596	3	5083	USA	X	S	X	3/5		
597	4	5085	USA	X	R	X	3/5		
598	3	5074	CIV	X	S	X	3/5		
599	3	5076	CIV	X	R	X	3/5		
601	4	5078	CIV	X	S	X	3/5		
602	4	5080	CIV	X	R	X	3/6		
603	4	5082	CIV	X	S	X	3/6		
604	3	5084	CIV	X	R	X	3/6		

PERSONNEL AUDIT [illegible] EXPERIMENT 5

Subject Number	[illegible]	Run	Source	Subject Question-naire	Experimenter Data Sheet	Debriefing Question-naire	Date	Name	Comments
605	4	5086	CIV	X	S	X	3/6		
606	3	5088	CIV	X	R	X	3/6		
607	4	5090	CIV	X	S	X	3/6		
608	4	5092	CIV I.O.A.	X	R	X	3/6		
609	4	5094	CIV	X	S	X	3/6		
610	3	5096	CIV	X	R	X	3/6		
611	4	5087	USA	X	S	X	3/6		
612	4	5089	USA	X	R	X	3/6		
613	0	5091	USA	X	S	X	3/6		
614	4	5093	USMC	X	R	X	3/6		
615	4	5095	USMC	X	R	X	3/6		
									End Exp. 5
									Board N

APPENDIX H

RAW DATA RETRIEVAL

The following raw data have not been reproduced as part of this report because of their bulk and limited value. The originals are available through the SEEKVAL Program Office.

1. Record photographs (8 x 10 color prints and 35 mm black-and-white negatives)

2. Photometric data sheets

3. Run data punched cards

4. Daily run schedule and log

5. Experimenter's check sheet and manual log

6. Subject questionnaire

7. Debriefing questionnaires

8. Observer audit.

Likewise, the two color video tapes used for briefing and the black and white video tapes[1] on which the experimental runs were recorded can be found at the SEEKVAL Program Office.

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[1] An attempt was made to record on video tape every experimental run, by recording from the Observer's TV sensor. Recording began when the Experimenter pressed the "start" button and called out the run number on his audio channel. This audio was recorded on the video tape, so each recorded run can be identified. Recording of the run stopped when the Observer signaled acquisition.

This recording was more successful in the fixed wing experiments, since the TV sensor was always guided by either the Observer's head movement or the control stick. However, many of the rotary wing experimental runs did not use the TV sensor since even though the TV aid was available, the Observer often chose not to use it. In other runs, the time to acquisition was so short that the recorded video offers only a glimpse of the terrain model and the audio identification could not be completed.

SEEKVAL EXPERIMENT IB1
PROCEDURE SVIB1-1A
READY ROOM BRIEFING PRESENTATION
FIXED WING

EXHIBIT I

Welcome to Martin Marietta and to the SEEKVAL Combat Air Support Target Acquisition Program. You are about to become an observer in an experiment program sponsored by the Department of Defense Combat Air Support Target Acquisition Program known as "SEEKVAL." The purpose of this program is to investigate the acquisition of ground targets from the air.

In a mobile ground war, a critical task to be performed from the air is the location and destruction of tanks and trucks during missions of close air support of ground forces, interdiction of roads, trails and rivers, and in strikes against the enemy's lines of communications. In the case of mobile warfare, one of the hardest tasks is that of locating vehicles in spite of the enemy's attempts at camouflage, use of covering terrain as masks, during adverse weather and low-visibility conditions. Obviously we want to make target acquisition at maximum ranges and as quickly as possible. A first-pass capability is desirable to reduce aircraft losses. Recent past military operations reveals that the detection and recognition of vehicles from the air is not an easy task from modern high-speed aircraft. As you probably know, targets the size of tanks are not easy to "spot" even in normal terrain conditions such as may be encountered in a representative portion of the Central European environment. Even with visual aids such as stabilized optics and special electro-optical devices, not all of the possible targets are detected and the average acquisition rate in combat may be well below 50%. Recognizing this problem, the Director of the Department of Defense Research & Engineering instituted a systematic program of research to determine the performance that could be expected in acquiring targets from the air by direct vision and by the use of visual aids under various test conditions.

The conditions we are testing here include evaluation of various methods of search and techniques of target acquisition. The scientists providing the technical guidance on this program have determined that a large terrain table simulation program of research augmented by judicious flight testing is one method of approach to be used.

The Martin Marietta Aerospace Optical Laboratory has been selected as one of the primary experimental locations because of its capability for simulating flight profiles and because of its visual laboratory system and computational capability as well as our extensive prior research into the problems of target acquisition. Our large terrain table provides realistic representation of the ground in which will be located the tank targets that you will be searching for from your cockpit. To simulate flight over the target area your cockpit stays in place while the terrain table will be moved to simulate flight conditions. You will search for targets by looking out the windscreen of a simulated cockpit. In all cases here your tactical targets will be US M60 tanks located in various areas on the terrain table.

Here we are running five separate experiments. These in general are three (3) tests using fixed wing flight profiles and two (2) using helicopter pop-up maneuvers. You will be a member of our test team in a fixed wing experiment. Your job will be to act as an observer and find the tank targets for us. We want to find out how well you can find these tanks under the experimental conditions of illumination, target locations, ranges and altitudes that are being controlled in our tests. Obviously some of these targets will be easy, some will be hard.

We are not grading your performance as an individual and you will not be given a "score." There are no right answers. This is scientific research, not performance testing. In this scientific experiment, you are to be a key member

of the experimental team. Your ability to find the targets is crucial to our study. Thus we espect you to try to do your very best.

We will do the following things here today:

1. First, we will also need some personal information, some idea about flying experience, and about any special experience or training you may have had in tactical target acquisition.
2. Next, we will ask you to take a vision test. The objective of this test is to establish your baseline visual capabilities. Since finding targets is primarily a visual operation, you can understand our need for this information.
3. We will show you a TV tape of the target area and typical targets.
4. We will give you a chance to see the map of the target area in which you will be working, and we'll ask you to look at some aerial photographs of our operational area. We expect you to become as thoroughly familiar with the terrain of the target area as it is possible to be without an actual check ride over it. You are going out on a target acquisition flight. It will simulate an armed area search for tanks as targets. Any target (that is tanks) you find in this area can be considered as targets to be fired upon. Thus your complete familiarity with the area will help you find your targets.
5. You will be given a specific mission briefing so that you will know exactly what you will be doing in your particular test series.
6. When your turn comes you'll be picked up by your test experimenter. This individual will be your personal escort for the test series you will run. He will escort you to the Optical Laboratory where the tests will be conducted.

7. You will be seated in the cockpit and then you will put on the helmet that will be used. You will be checked out on the specific equipment in the cockpit and the procedures you are to follow in the test runs. You will be allowed several minutes practice to be sure that you know how the equipment operates.

8. Then the test runs begin! For each test run you will be given a specific briefing for that one run. The target area in which you are to search for tanks will be pointed out to you on your oblique aerial photograph. You will be expected to search that area for tanks. When you are sure of your target, you can signal acquisition by pulling the switch on your control stick. This signifies that you have found the target and the run will end.

9. Then the experimenter will verify with you the target location by a short de-briefing and meanwhile the next run will be set up.

10. After you have finished your test series, the experimenter will escort you out of the laboratory. He will de-brief you, tell you about your part of the exercise and answer any questions he can. When you are finished you are then free to go. Meanwhile we ask that you wait in the Holding Room, where we will take you after the briefing until your turn to run the tests. After the runs, Military personnel will be allowed to wait in the GDC office area if you need to do so.

Coffee and tea are available. This coffee mess operates on the honor system. We ask your cooperation. The bathroom is located in the rear of this room. Any questions?

Now, would you please, fill out the questionnaire? Then we'll look at the TV tape, conduct a target area briefing, take the vision test, and demonstrate by use of the mockup how the equipment in the cockpit simulator works.

SEEKVAL SUBJECT QUESTIONNAIRE EXHIBIT II

Do Not Write in this Space

Subject No.__________
Date__________
Time__________
Vision Test Results __________
____
____

Name__________

Date of Birth__________

Military: 1. Rank__________

2. Serial No.__________

Martin Marietta: 1. Badge No.__________

2. Dept. No.__________

Do you wear glasses? ▭ Yes ▭ No If "Yes" please explain

____

____

Type of Flight Experience (If any):

1. ▭ Fixed Wing ▭ Rotary Wing
2. Flight Hours
   - a. ▭ 0 - 500
   - b. ▭ 500 - 1500
   - c. ▭ 1500 - over

Comments:__________

____

____

Combat air support training and flight experience (If any)__________

____

____

____

Are you currently on active flight status? ▭ Yes ▭ No

Type of flight assignment__________

____

HOW TO SEARCH FOR AND FIND TARGETS

EXHIBIT III

If you have not had any training or experience in air-to-ground target search, the following instructions should help you.

If you are experienced, we suggest you review this information. In this simulation your targets will be 800:1 scale models of U.S. M-60 tanks. (Examples of the scale models are mounted in the Briefing Room.)

TACTICS & FORMATION

- Russian tanks move and attack in platoon formations.
- In the attack, platoon formations are usually tanks abreast (i.e., moving in a line parallel to each other) and spaced 50-60 meters apart.
- Cross-country tactical movement in the attack is the rule.
- Roads are rarely used in attack situations.

SEARCH PROCEDURES

- Slowly evenly sweep your view across the search area. Your eye fixates for a brief second. Thus look at the area of search the way you read this page, a "chunk" at a time.
- Targets are different from the background trees and bushes. Look for regular shapes, straight lines.
- Know the relative size of the target compared to the expected background. (See example in the Briefing Room)
- Know the particular shape of the target. Shape changes as aspect angle changes. The straight lines and distinctive pattern of tank gun, hull, and treads should be noted. Bushes and trees conversely, usually have less precise edges and corners.
- Know where to expect targets. It is almost impossible to see tanks in heavy tree cover. In this attack situation you should search open areas and fields. Do not expect to see tank targets in the trees.
- Differences in contrast of the target with the background are good cues. Dark targets on light background or light targets on dark background may be cues.
- Shadow may help emphasize contrast and provide a cue as to target shape.
- Your time is limited. The longer you remain in a search position the more likely it is you may be shot at. In this test you will have only about one minute to locate the area and find your targets. Thus "learn" the area by careful review of the briefing photos and maps. Spend your time looking for targets.

"Good Luck" is really careful preparation.

SEEKVAL AIDED VISUAL
TERRAIN TABLE EXPERIMENT

EXHIBIT IV

EXPERIMENT IB1
(FIXED-WING)

TV TAPE SCRIPT

Script: D.B. Jones
D.G. Smith
December 6, 1974

SEEKVAL AIDED VISUAL TERRAIN TABLE EXPERIMENT
Experiment IB1

VIDEO	AUDIO
1 TITLE:	
	NARRATOR:
2 Floor level overall pan of environment	This is the optical laboratory of the Martin Marietta Guidance Development Center. The scale terrain model housed here duplicates topographical sections of Fort Lewis, Washington, and typical Central European rolling hills.
3 High angle view of table zoom out from C.U. to L.S.	Here is a German Farm Village with crossroads near a river. The view widens to reveal a pine tree forrested area typical of Fort Lewis. The road running down the right side of the picture runs north and south on the table through our area of operations. Remember that the terrain model is merely a realistic simulation of these geographic areas.
4 L.S. cockpit dolly in and zoom to C.U. cockpit.	The blue structure on the screen is the simulated cockpit or habitat, from which you will conduct your search for targets. On the right is the experimenter's station where we will record the results of your target acquisition experiment. The simulated cockpit contains several important features which we will briefly describe.
5 C.U. cockpit zoom in to ECU track stick	On the operators left is the track stick, used to control and point the sensor in the aided visual experiments, and to record when you have acquired the target. The right thumb button actuates the Television track stick. The left button engages the helmet-mounted sight. The center knob controls the field of view of the TV sensor. The trigger switch, actuated by the index finger, indicates that you have identified the targets and ends the experimental run.
Pan RT to ECU T.V. display and zoom out to C.U. cockpit	Located directly in front of you is a video display unit. This unit is used in the aided visual experiments only and will be turned off during the direct view experiments.

VIDEO	AUDIO
6 C.S. cockpit and experimenter station (FADE OUT)	Located to the pilot's left is the experimenter's station where the experimenter will record the test data.
(FADE IN) 7 Overall shot Terrain Model	You will be brought to a simulated altitide of 3000 feet and fixed in position. The terrain table will "fly" under you at a simulated ground speed of 420 knots, representing the "fast FAC" or forward air controller environment.
8 M.S. village on terrain model (Color Run #1)	Our target for this first demonstration run is a column of tanks at the road junction in the village. The tanks are traveling from east to west on the horizontal road and northwest on the vertical road. Now you should be able to see the tanks clearly. One tank has just turned right heading northwest on the crossroad.
9 Black and white Run #1	The aided visual portion of the experiment will be conducted using black and white television imagery. Let's repeat the previous scene using the black and white television system that you will be using. You can now see tanks at the crossroad.
10 Color Run #2	Now we will run a series of color and black and white runs at various target locations. In this case, a tank is located in the center of the screen just to the left of a small group of trees. The scene is scalled at 800 to 1.
11 B&W Run #2	Now let's repeat the scene with the black and white camera with a zoom to the narrow field of view.
12 Color Run #3	The location of the tanks in this run is to the left of an airstrip which is situated in the northeast sector of our area of operations. Looking closely, you can see one tank on the road and two approaching the airstrip.
13 B&W Run #3	Now we will repeat this acquisition demonstration using the black and white camera. Can you identify the three tanks?
14 Overall shot over terrain to simulate zoom in to cockpit module	The previous illustration runs have been shown so that you will have some idea of what will be required of you during the experiments.

VIDEO	AUDIO
	The video program has also shown you the environment you will be working in. Your participation in this experiment is essential to the scientific evaluation of some of the key factors in target acquisition. The success of our joint effort depends on your active and efficient performance in our simulation of the combat air support target acquisition process. Thank you for your participation.
15 TITLE: Martin Marietta	

SEEKVAL EXPERIMENT IB1
PROCEDURE SVIB1-1C
FIXED-WING MISSION BRIEFING EXHIBIT V

Here on the wall is a photograph of our terrain model. The model is 12 meters by 12 meters. This photograph is an oblique view representing what you will see from the cockpit simulator as you approach your target area. The photograph is divided into six different target areas. You will search for your targets one area at a time. Your targets will be only tanks. They will be exactly the size of the tanks you see on the model here. The tanks will always be on the open terrain, although some clutter may be around them, and never in the heavily forested areas. You will be flying over a free-fire zone. Any tank you see in the particular area you are searching is a target.

You will carry with you in your cockpit a copy of this photograph with the six target areas outlined, to be used as a mission briefing. Your experimenter will tell you in which area to search, prior to your runs. The map above is a top view of the same terrain with the six target areas outlined. It shows topographical features of the terrain. On the sides are close-up view photographs of the six target areas (see SVIB1-1C1).

As you saw in the film, your cockpit will be brought to a simulated altitude of 3000 f (914 meters) and fixed in position. The curtain in front of you will be lifted as the terrain starts moving towards you, simulating a flight speed of about 400 knots (736 km/h).

When you see your target you signal acquisition by pressing the trigger on the control stick. You signal acquisition when you are sure enough of your target's location that you are willing to commit ordnance. (Remember that the "enemy" could be shooting back.) Immediately the curtain comes down in front of you, the run stops and the range at which you spotted your target is recorded by the computer.

While the curtain is down, the cockpit and terrain will be repositioned for the next run. During this time your experimenter will ask you questions about the target you just saw. You can show him by pointing out on your photograph, the

location of the targets, the number of tanks that you saw, the color of the tanks, and, if you were close enough to tell, the direction in which the tanks were headed.

Although there may be more than one tank per target area, you trigger-off only once.

Your cockpit will be positioned either left or right, depending on which side of the terrain you are searching for targets in.

You will always be flying north, straight and level. You will not "fly" the aircraft at all.

Are there any questions on what we have talked about so far?

Now, using the mockup, I will demonstrate what you will do in your cockpit. Each one of you will use one of the four different search methods: direct vision, in which you look directly at the terrain and when you see the target you press the trigger; direct vision aided by the TV sensor with the lens on a wide field of view; direct vision aided by the TV sensor with the lens on a narrow field of view; and direct vision aided by the TV sensor with the zoom lens capability.

(At this point tell each observer what type of search method they will use.)

(Call out the first name and demonstrate equipment. Example:)

Direct Vision:

You will enter your cockpit and sit on a seat identical to this one; you will fasten the safety straps; you will wear a helmet like this one (aid observer in putting helmet on). This helmet has a helmet sight which you will see on your visor. I will lower the visor. (Turn helmet sight on.) Do you see the reticle? The brightness of the reticle can be adjusted. You will use the reticle to acquire targets. The TV sensor is linked to your helmet sight. Although you will use only direct vision and your TV screen will be off, your Experimenter has a TV display. His will be on and he can see where you are searching.

However, for the TV sensor to be guided properly, you must look through the reticle at all times and search by moving your head instead of moving your eyes across the visor. The helmet sight will be boresighted for each one of you individually to insure accurate control of the TV sensor. (Aid observer in removing helmet and show how helmet sensors work.) There will be sensors on either side of your cockpit. They read the position of the lights on the sides of your helmet and thus guide the TV sensor.

(Call out the next observer and demonstrate equipment. Example:)

<u>Wide Field</u>

(Aid observer in putting on helmet and ascertain that he sees the reticle; then:)

The TV screen in front of you will be on for your run set. It is there to help you find targets; however, you are not required to use it.

Whatever you see through the reticle will be displayed on your TV screen.

The control stick on your left side can also be used for controlling the TV sensor. The knob on the center is the zoom control. It will be inoperative for your runs since you will only use the lens set on wide field.

The buttons marked "H" and "S" control the mode of the TV sensor. In the "H," or helmet mode, the sensor is guided by your head movement.

To look at your screen, press the "S" or stick mode. That disengages the TV sensor from your helmet sight and leaves it pointing in the direction in which you were looking at the time you pressed the "S" button.

Now you can look down at your TV screen and control the TV sensor by moving the stick.

If you want to look directly at the terrain again, press the "H" button and the sensor goes back to the helmet mode. You can switch back and forth any number of times and you can trigger off either looking directly at the terrain through the reticle or looking at your TV screen.

Narrow Field

(The briefing for the narrow field of view was essentially the same as for the wide field except that the scene on the TV screen is a much narrower area.)

Variable Field

(The briefing for the variable field of view was essentially the same as for the wide field except that the field of view can be varied using the zoom control.)

For those of you who will be using the TV aid, you will get a chance to "play" with it before you start your runs so that you will be fully familiar with its operation. Remember that the TV is an aid. You do not have to use it if you find you can do better without it.

Let me reiterate some of the important things to remember:

1) When looking directly at the terrain, look through the reticle and search by moving your head and not your eyes.
2) Make sure that the TV sensor is in the right mode (H or S) so that your experiment can see what you are looking at.

If there are no more questions we will go to the Holding Room, which is right outside the lab. There you will wait for your Experimenter. You will not return to this room, so take all personal belongings with you.

(Observers are transferred to Holding Room)

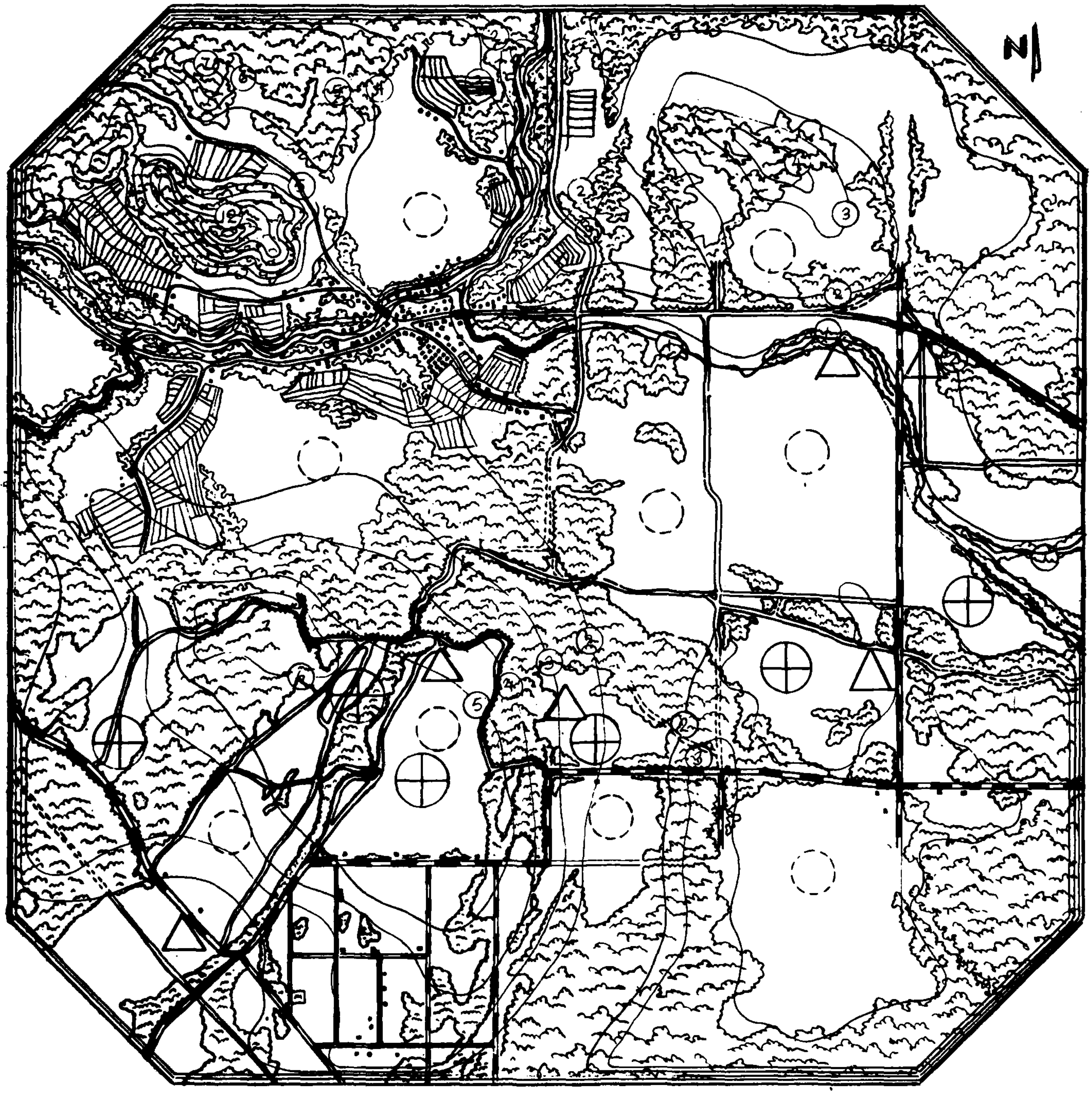


Exhibit VI. Terrain Table Map

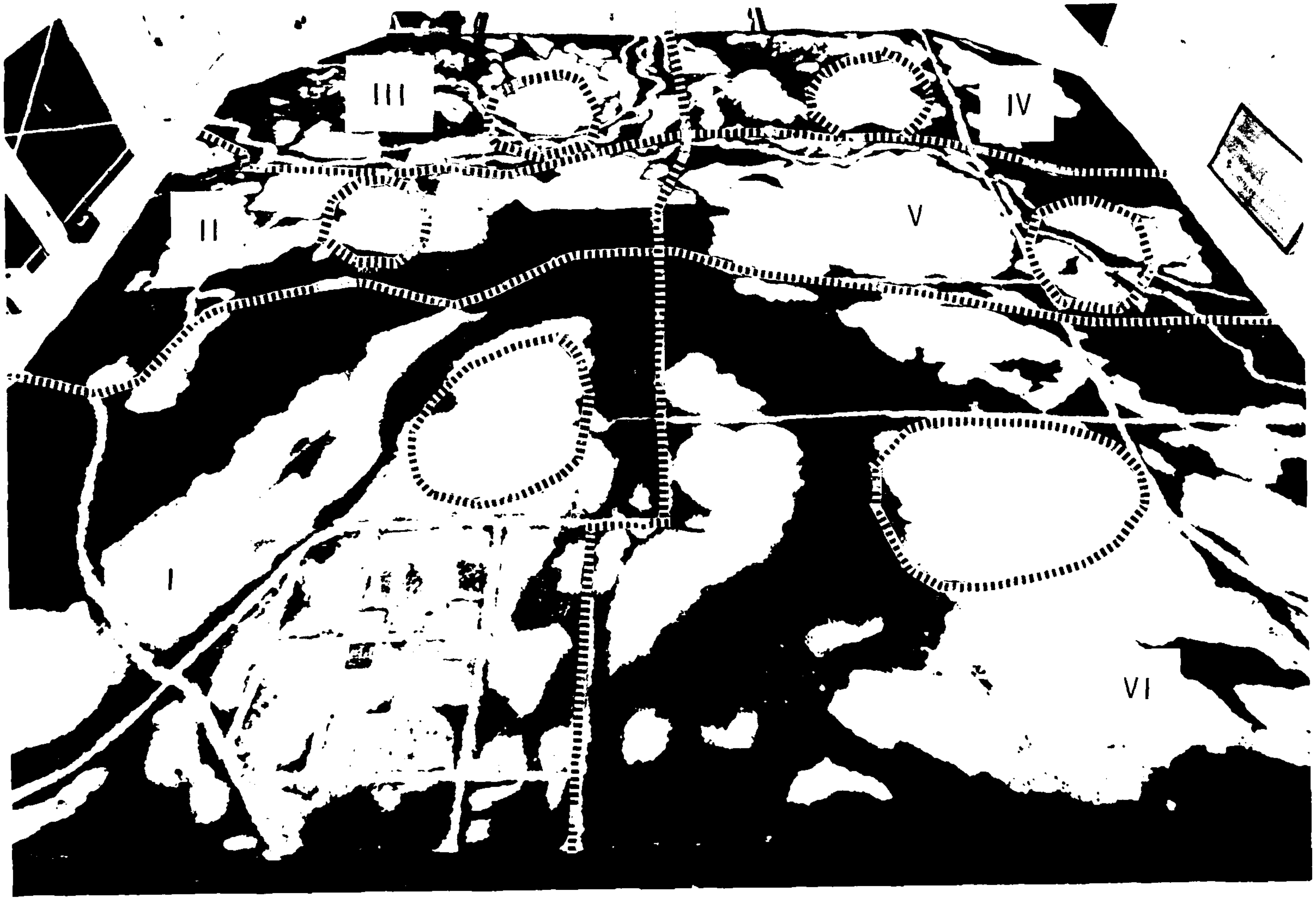


Exhibit VII. Terrain Table Overall View

Exhibit VIII. Target Area I

Exhibit IX. Target Area II

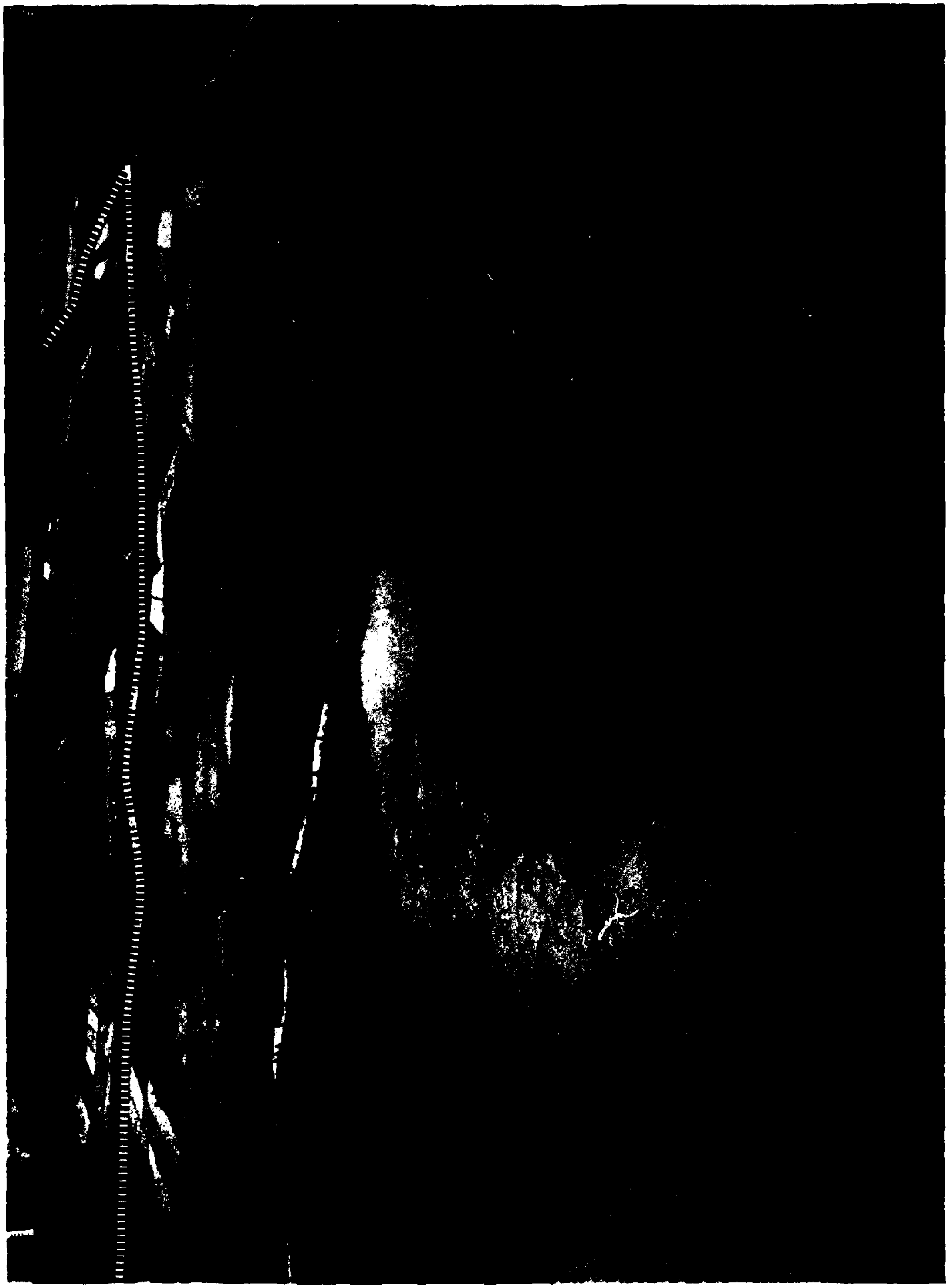


Exhibit X. Target Area III

Exhibit XI. Target Area IV

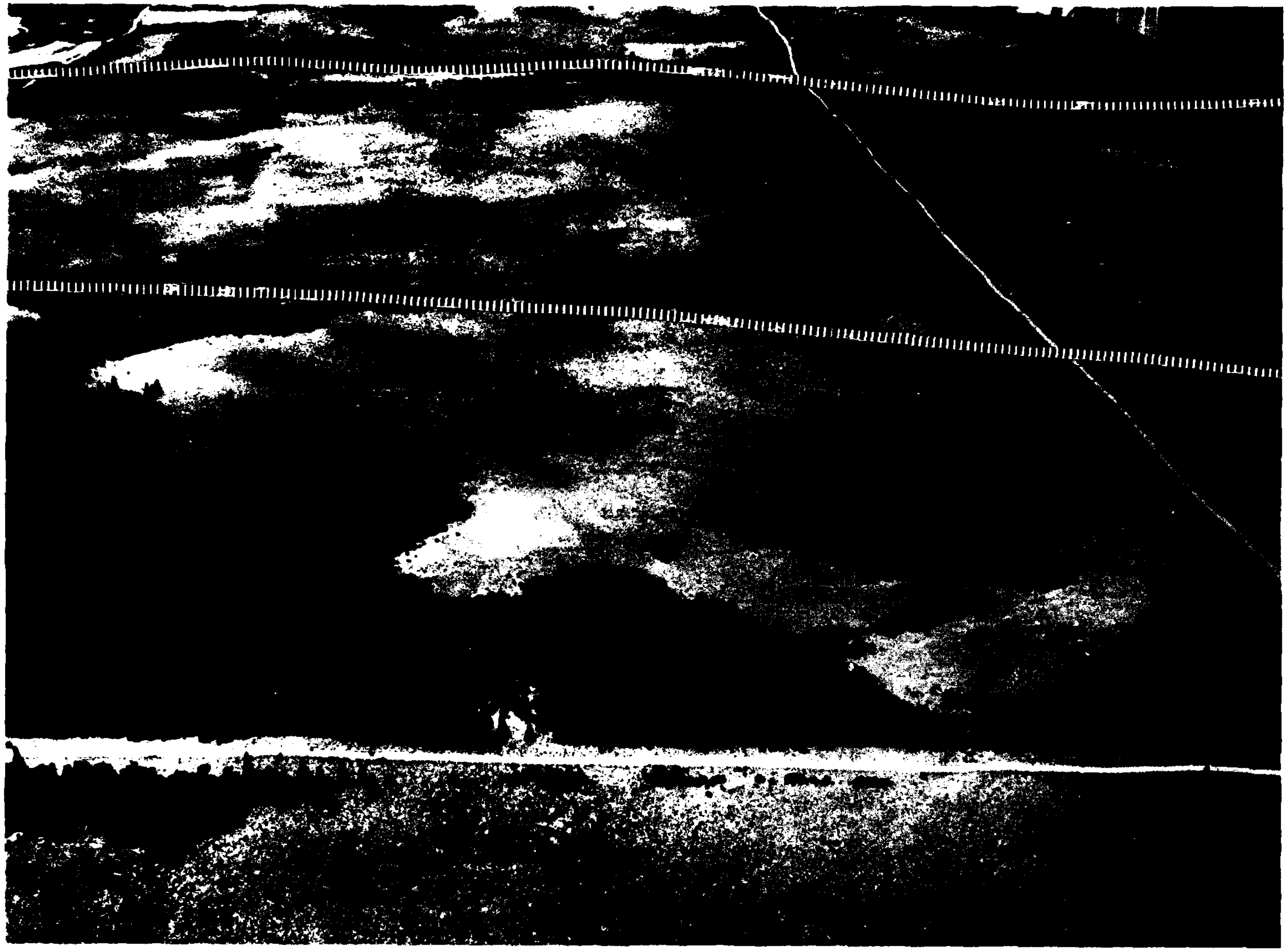
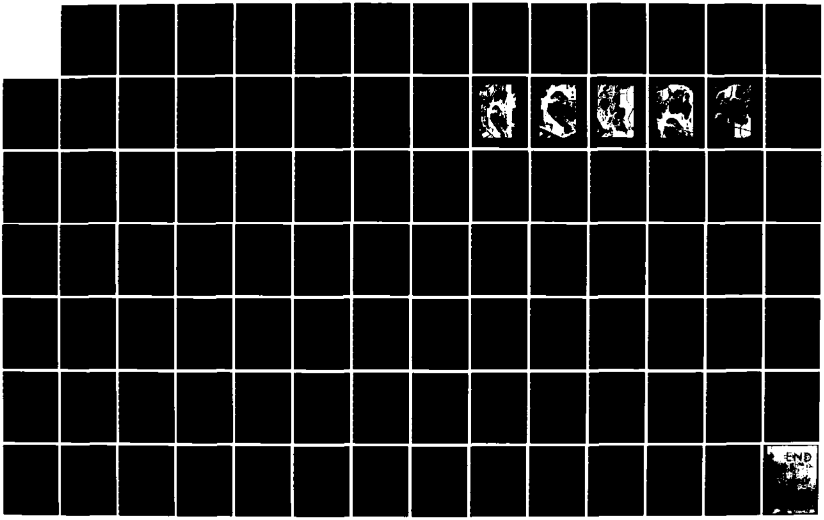


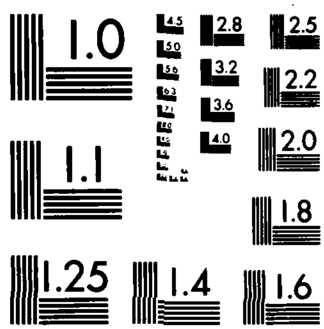
Exhibit XII. Target Area V

Exhibit XIII. Target Area VI

AD-A145 164 JOINT TEST PROJECT REPORT OF COMBAT AIR SUPPORT TARGET ACQUISITION PROGRA..(U) MARTIN MARIETTA AEROSPACE ORLANDO FL P B BRIGHAM SEP 75 OR-13698 4/4

UNCLASSIFIED F29601-74-C-0122 F/G 17/8 NL





MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

SEEKVAL EXPERIMENT IB1
PROCEDURE SVIB1-1C1
FIXED WING TARGET AREA DESCRIPTION EXHIBIT XIV

Area I is in the SW corner (your near left corner) of the terrain table. It is bounded by the main N & S road in the approximate center of the table; and by the road that runs approximately E & W through the wooded area about one-third of the distance from the S edge to the N edge of the table.

Tanks are reported in the field NE sector of Area I, North of the E-W road that bisects the Eastern part of the area and short of the heavily forested tree line.

Area II - This area also lies W of the N & S road, N of area I and S of the road that runs E & W along the river and through the village.

Tanks are reported in Area II, somewhere in the field just North of the heavily forested space in the center of the area.

Area III is in the NW corner (your far left corner) of the terrain table. It is bounded on the S by the road that runs E & W along the river and through the village.

Tanks are reported in Area III, in the open field East of the hills.

Area IV is in the NE corner (your far right corner) of the terrain table. It is bounded on the W by the N & S road; and on the S by the E &W road that runs just N of the airstrip.

Tanks are reported in Area VI in the open field N of the E-W road that is the southern boundary of the area, and between the mountain and the N-S road.

Area V - W of the N & S road, bounded by Area IV on the S and by the E & W road that runs from the village, just N of the airstrip to the edge of the table.

Tanks are reported East of the N-S road on the East side of the area.

Area VI - This area is in the SE corner (your near right corner) of the terrain table. It is bounded on the W by the main N & S road; and on the N by the E & W road that is the extension of the N boundary of Area I.

Tanks are reported in the Northern half of the very large open field in the center of Area IV.

SEEKVAL EXPERIMENT IB1
PROCEDURE SVIB1-4A
FIXED WING RUN BRIEFING EXHIBIT XV

You have reviewed the briefing materials and should be familiar with the map and aerial photos of the target area.

Remember that the target area is a free-fire zone. Any tanks you may find in the areas can be fired upon. In this experiment we will ask you to find tanks as targets. When any particular target has been found to your satisfaction, place the helmet sight reticle on the target and keep it there when you press the event marker switch. Do not press the switch until you have found the target and are ready to end the run. On the track stick in your left hand is the event marker switch. When you pull this switch you are indicating that you have found the target. This means that you have found a target and are sure enough of its location that you are willing to attack. When you pull that switch, the run ends. Do not pull it until you find the target.

As you look for targets turn your head so that the helmet sight reticle is on the area in which you are searching for targets. This is one way we have of knowing where you are looking.

When the run begins this curtain will rise out of the way and you can see the area of operations. The terrain will be so far away that you will not be able to see any tanks. First find the area in which your target should be located, then begin your search for tanks. When you find any tanks be sure to keep the helmet sight reticle on them.

When you have found the target pull the indicator switch.

That terminates the run. The curtain will drop in front of you. I will then ask you some questions about the target to help verify some of the data we are collecting.

If by chance you have not found the target in time the curtain will close and that also ends the run.

Meanwhile the model returns to the initial location and the setup for the next run is prepared and verified.

I will brief you on the next target and we repeat the sequence.

Here is the aerial photograph of our general operational area. Keep it for all flights. On this mission enemy tanks have been reported in this area of your zone of operations. The target area is described as: (The Observer is handed the photograph (Exhibit VII), and for each run the appropriate area description from Exhibit XIV is provided verbally,)

Do you have any questions about how we will operate? Is your helmet sight in position?

Do you understand how your equipment operates? On this test you will search for targets using direct vision. (*If this is an aided mission, the comments below are inserted at this point.) Remember to place the helmet sight reticle on the target and keep it there when you press the event marker switch. Do not press the switch until you have found the target and are ready to end the run.

Are you ready? (To test conductor) Experimenter ready!

---

*

In addition, you have the option of using the TV system as an aid. You have (here, state NF, WF, or VF; if VF identify control on track-stick). The TV camera look-angle is controlled by your helmet sight but the control may be shifted to the track-stick by pressing and releasing this button on the track-stick. Control is returned to the helmet by pressing and releasing the other button.

Now I will raise the curtain (you cannot see the terrain model target areas from this elevation and distance). Looking along this edge of the model, at those bolts and fittings, practice tracking with the helmet sight and shifting back and forth from the track-stick control. There is considerable parallax at this angle, but it will not be present when we go to altitude. (Allow about a minute for this practice; if VF add practice with zoom and suggest WF for search and NF for identification). Now I will lower the curtain and we will proceed.

Dec. 3, 1974

SEEKVAL EXPERIMENT IB1
PROCEDURE SVIB1-8
MISSION DE-BRIEFING

EXHIBIT XVI

Thank you for participating in this series of SEEKVAL experiments.

As I told you when we first began our runs, there are no right answers. The tests have been designed not as a performance measure but as an experiment. In general, your mission has been to find tank targets in terrain typical of central Europe. We have, as you have seen, varied locations and other factors related to the target. Our objective has been to secure baseline data that will be useful in future operations. As near as I can tell, your personal performance was very good. The results will help us very much.

You will, I'm certain, have a chance to discuss what you saw and did here today with other members of your unit (or other employees at Martin Marietta). We ask you, in the name of good scientific research, not to talk about what you saw and did in any detail. The name of this game is research. In the good name of science we ask you to not discuss your results with others. It is vital to the experiment that all participants start out with essentially the same knowledge about the terrain and the operations that are being conducted. If you talk too much about the situation, especially to those who have not had their turn you could well invalidate the results. Particularly, the layout of the terrain and the target locations are sensitive and should not be talked about.

You should also know that not everyone is doing the same thing. Each group of participants here will perform a different set of missions. While the terrain in which you searched for our tank targets is the same for everyone the procedure used and the targets are not always the same. Thus even if you "compare notes" with some other participants you may find out he did not do what you did. When you do this, some future participant may hear you.

Thank you again. Your part is done. You may now return to your duties. Please do not go back to the reception and briefing area. (Military personnel may wait in the Debriefing Room, but not in the Ready Room. If you desire, I will escort you there.)

NUMBER:

SEEKVAL DEBRIEFING QUESTIONNAIRE (FIXED WING) EXHIBIT XVII

Please help us with this study by answering the following questions honestly and candidly.

1. Was the visual scene (terrain model, target area and targets) a realistic simulation? Yes No.
   Comments____
   ____
   ____

2. Did the target area briefings help you? Yes No
   Comments____
   ____
   ____

3. Was the general information briefing and taped TV presentation helpful in showing you what to expect? Yes No
   Comments____
   ____
   ____

4. For many test runs a "spotlight" was used to simulate the sun's shadows. In your opinion, was this an effective simulation? Yes No
   Did shadows help you find the target? Yes No
   Comments____
   ____
   ____

5. Did the helmet sight help you? Yes No
   Hinder you? Yes No

6. In many test runs a television was available. Did you have a TV?
   Yes No
   If yes, please answer the following:
   a. Did you use the TV at all? Yes No
   b. Did the TV help you find targets? Yes No
   c. Did the helmet sight help you use the TV? Yes No
   d. Was the track stick helpful in using the TV? Yes No

   Comments____
   ____
   ____

7. What suggestions can you make to help improve this test?
   ____
   ____
   ____
   ____
   ____

APPENDIX J

ROTARY WING BRIEFING AND DEBRIEFING MATERIALS AND OBSERVER FLOW[1]

Procurement of Experimental Observers took two forms, one for Martin Marietta personnel (untrained), the other for military personnel (trained).

Martin Marietta personnel were recruited through requests for volunteers appearing in the company weekly newspaper. In a few cases, Observers were obtained through direct requests when a no-show created the necessity for quick reaction. In every case, an initial telephone contact was used to explain the general requirements for Observers and the amount of time required. Upon acceptance of the conditions, the prospective Observer was given a reporting time for screening and briefing.

Military personnel were designated by the Service involved. They too were given a reporting time through coordination with the supplying commands.

All Observers were directed to the Guidance Development Center (GDC) gate; road signs were employed to assist military personnel. Reporting times were generally such that briefings were conducted for groups of four Observers. Upon arrival at the gate, the Observers were directed to the heliport ready room by the security guard on duty. Upon arrival at the ready room, Observers were greeted by their briefer and given a folder containing a copy of the Ready Room briefing presentation, a subject questionnaire, and a short instructional presentation on target search procedures. These appear here as Exhibits I, II, and III.

While Observers were reading the briefing material and filling out the questionnaire they were called one by one to take the visual acuity and color perception tests. They were also urged at this time to use their spare time studying the briefing photos and map posted on the wall (Exhibits VI through XI.

Then, the color TV taped briefing was shown. The script appears here as Exhibit IV. Following the tape, questions were solicited; the answers were framed not to exceed the level of briefing presented in the written material while being as complete as possible.

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[1]This Appendix describes the Observer flow and processing used in rotary-wing sub-experiments 4 and 5. For the equivalent presentation of fixed-wing sub-experiments 1, 2, and 3, please see Appendix I.

The mission briefing, Exhibit V, was then given. The first part of the briefing was general, dealing with the terrain model map (Exhibit VI), the oblique color photo of the entire terrain model (Exhibit VII), the four area photographs and area description (Exhibits VIII through XII), and an 18 inch square model of the terrain table surface at the same scale with three tanks emplaced. The tanks were arranged in line abreast, exactly as they appeared on the terrain table but the Observers were not told to expect this particular formation.

Each Observer was given an individual briefing using the mock-up seat, pantograph sight and magnifying optics, and gimbal hand controller in the ready room. This portion of the briefing was restricted to the particular search method to be used by the individual Observer.

All briefed Observers were then transferred to the holding area where they awaited their turn. Each Observer, in turn, was escorted by his Experimenter to the habitat (taking a route which avoided a preview of the terrain table). Once inside, the Observer was given his run briefing and allowed to familiarize himself with the habitat and controls (Exhibit XIII). At this point, and throughout his runs, the Observer had a copy of the overall terrain table photo (Exhibit VI) with him in the cockpit.

Upon completion of his runs, the Observer was escorted to the debriefing area, given his debriefing (Exhibit XIV), and asked to complete the debriefing questionnaire (Exhibit XV).

Following debriefing the Observers were asked to leave the GDC area; if military Observers wished to wait for other personnel, they were asked to remain clear of Observers who had not yet been tested.

SEEKVAL EXPERIMENT IB1
PROCEDURE SVIB1-1B
READY ROOM BRIEFING PRESENTATION
HELICOPTER

EXHIBIT I

Welcome to Martin Marietta and to the SEEKVAL Combat Air Support Target Acquisition Program. You are about to become an observer in an experiment program sponsored by the Department of Defense Combat Air Support Target Acquisition Program known as "SEEKVAL." The purpose of this program is to investigate the acquisition of ground targets from the air.

In a mobile ground war, a critical task to be performed from the air is the location and destruction of tanks and trucks during missions of close air support of ground forces, interdiction of roads, trails and rivers, and in strikes against the enemy's lines of communications. In the case of mobile warfare, one of the hardest tasks is that of locating vehicles in spite of the enemy's attempts at camouflage, use of covering terrain as masks, during adverse weather and low-visibility conditions. Obviously we want to make target acquisition at maximum ranges and as quickly as possible. A first-pass capability is desirable to reduce aircraft losses. Recent past military operations reveals that the detection and recognition of vehicles from the air is not an easy task from modern helicopters. As you probably know, targets the size of tanks are not easy to "spot" even in normal terrain conditions such as may be encountered in a representative portion of the Central European environment. With visual aids such as stabilized optics and special electro-optical devices, not all of the possible targets are detected and the average acquisition rate in combat may be well below 50%. Recognizing this problem, the Director of the Department of Defense Research & Engineering instituted a systematic program of research to determine the performance that could be expected in acquiring targets from the air by direct vision and by the use of visual aids under various test conditions.

The conditions we are testing here include evaluation of various methods of search and techniques of target acquisition. The scientists providing the technical guidance on this program have determined that a large terrain table simulation program of research augmented by judicious flight testing is one method of approach to be used.

The Martin Marietta Aerospace Optical Laboratory has been selected as one of the primary experimental locations because of its capability for simulating flight profiles and because of its visual laboratory system and computational capability as well as our extensive prior research into the problems of target acquisition. Our large terrain table provides realistic representation of the ground in which will be located the tank targets that you will be searching for from your cockpit. To simulate helicopter pop-up maneuvers in the target area, your cockpit will be set at a selected altitude and the terrain table will be fixed under you to simulate the desired range. You will search for targets by looking out the windscreen of a simulated cockpit. In all cases here your tactical targets will be US M60 tanks located in various areas on the terrain table.

Here we are running five separate experiments. These in general are three (3) tests using fixed-wing flight profiles and two (2) using helicopter pop-up maneuvers. You will be a member of our test team in a Rotary Wing experiment. Your job will be to act as an observer and find the tank targets for us. We want to find out how well you can find these tanks under the experimental conditions of illumination, target locations, ranges and altitudes that are being controlled in our tests. Obviously some of these targets will be easy, some will be hard.

We are not grading your performance as an individual and you will not be given a "score." There are no right answers. This is scientific research, not performance testing. In this scientific experiment, you are to be a key member

of the experimental team. Your ability to find the targets is crucial to our study. Thus we expect you to try to do your very best.

We will do the following things here today:

1. First we will also need some personal information, some idea about flying experience, and about any special experience or training you may have had in tactical target acquisition.
2. Next we will ask you to take a vision test - The objective of this test is to establish your baseline visual capabilities. Since finding targets is primarily a visual operation you can understand our need for this information.
3. We will show you a TV tape of the target area and typical targets.
4. We will give you a chance to see the map of the target area in which you will be working, and we'll ask you to look at some aerial photographs of our operational area. We expect you to become as thoroughly familiar with the terrain of the target area as it is possible to be without an actual check ride over it. You are going out on a target acquisition flight. It will simulate an armed area search for tanks as targets. Any target (that is tanks) you find in this area can be considered as targets to be fired upon. Thus your complete familarity with the area will help you find your targets.
5. You will be given a specific mission briefing so that you will know exactly what you will be doing in your particular test series.
6. When your turn comes you'll be picked up by your test experimenter. This individual will be your personal escort for the test series you will run. He will escort you to the Optical Laboratory where the tests will be conducted.
7. You will be seated in the cockpit and checked out on the specific equipment in the cockpit and the procedures you are to follow in the test runs. You

will be allowed several minutes practice to be sure that you know how the equipment operates.

8. Then the test runs begin! For each test run you will be given a specific briefing for that one target acquisition. The target area in which you are to search for tanks will be pointed out to you on your oblique aerial photograph. You will be expected to search that area for tanks. When you are sure of your target, you can signal acquisition by pulling the switch on your sighting station or on your control stick. This signifies that you have found the target and the run will end.

9. After you have finished your test series the experimenter will escort you out of the laboratory. He will de-brief you, tell you about your part of the exercise and answer any questions he can. When you are finished you are then free to go. Meanwhile we ask that you wait in the Holding Room where we will take you after the briefing until you are notified. After the runs, Military personnel will be allowed to wait in a de-briefing trailer area if you need to do so. Coffee and tea are available. This coffee mess operates on the honor system. We ask your cooperation. The bathroom is located in the rear of this room. Any questions?

Now, would you please fill out the questionnaire? We will take the vision test, look at the TV tape, conduct a target area briefing, and demonstrate, by use of the mockup, how the equipment in the cockpit simulator works.

SEEKVAL SUBJECT QUESTIONNAIRE

EXHIBIT II

Do Not Write in this Space

Subject No.__________

Date__________

Time__________

Vision Test Results __________

Name__________

Date of Birth__________

Military: 1. Rank__________

2. Serial No.__________

Martin Marietta: 1. Badge No.__________

2. Dept. No.__________

Do you wear glasses? ☐ Yes ☐ No If "Yes" please explain

Type of Flight Experience (If any):

1. ☐ Fixed Wing ☐ Rotary Wing
2. Flight Hours
   a. ☐ 0 - 500
   b. ☐ 500 - 1500
   c. ☐ 1500 - over

Comments:__________

Combat air support training and flight experience (If any)__________

Are you currently on active flight status? ☐ Yes ☐ No

Type of flight assignment__________

HOW TO SEARCH FOR AND FIND TARGETS EXHIBIT III

If you have not had any training or experience in air-to-ground target search, the following instructions should help you.

If you are experienced, we suggest you review this information. In this simulation your targets will be 200:1 scale models of U.S. M-60 tanks. (Examples of the scale models are mounted in the Briefing Room).

TACTICS AND FORMATION

Russian tanks move and attack in platoon formations.

In the attack, platoon formations are usually tanks abreast (i.e., moving in a line parallel to each other) and spaced 50-60 meters apart.

Cross-country tactical movement in the attack is the rule.

Roads are rarely used in attack situations.

SEARCH PROCEDURES

Slowly evenly sweep your view across the search area. Your eye fixates for a brief second. Thus look at the area of search the way you read this page, a "chunk" at a time.

Targets are different from the background trees and bushes. Look for regular shapes, straight lines.

Know the relative size of the target compared to the expected background. (See example in the Briefing Room)

Know the particular shape of the target. Shape changes as aspect angle changes. The straight lines and distinctive pattern of tank gun, hull, and treads should be noted. Bushes and trees conversely, usually have less precise edges and corners.

Know where to expect targets. It is almost impossible to see tanks in heavy tree cover. In this attack situation you should search open areas and fields. Do not expect to see tank targets in the trees.

Differences in contrast of the target with the background are good cues. Dark targets on light background or light targets on dark background may be cues.

Shadow may help emphasize contrast and provide a cue as to target shape.

Your time is limited. The longer you remain in a search position the more likely it is you may be shot at. In this test you will have only about one minute to locate the area and find your targets. Thus "learn" the area by careful review of the briefing photos and maps. Spend your time looking for targets.

"Good Luck" is really careful preparation.

SEEKVAL EXPERIMENT IB1
AIDED VISUAL
TERRAIN TABLE EXPERIMENT
HELICOPTER

EXHIBIT IV

TV TAPE SCRIPT

Script: D.B. Jones
D.G. Smith

February 5, 1975

SEEKVAL AIDED VISUAL TERRAIN TABLE EXPERIMENT
Experiment IB1

	VIDEO	AUDIO
1	TITLE:	
		NARRATOR:
2	Floor level overall pan	This is the optical laboratory of the Martin Marietta Guidance Development Center. The scale terrain model housed here duplicates topographical sections of Fort Lewis, Washington, and typical Central European rolling hills.
3	Hign angle view of table zoom out from C.U. to L.S.	Here (P) is a German Farm Village with crossroads near a river. The view widens to reveal a pine tree forrested area typical of Fort Lewis. The road running down the right side of the picture (P) runs north and south on the table through our area of operations. Remember that the terrain model is merely a realistic simulation of these georgraphic areas.
4	L.S. cockpit dolly in and zoom to C.U. cockpit	The blue structure on the screen (P) is the simulated cockpit or habitat, from which you will conduct your search for targets. On the right (P) is the experimenter's station where we will record the results of your target acquisition experiment. The simulated cockpit contains several important features which we will briefly describe.
5	C.U. cockpit zoom to ECU and pantograph Move pantograph	Mounted in front of you is the operator's sighting station or pantograph. This operator's sight will be used in the optically aided and TV aided experiments. It will not be used in the direct vision experiments.
6	Zoom to Optical Aid (Monocular)	Mounted on top of the operator's sight is a stabilized telescope used in the optically aided experiments.
7	Cut to Thumb Switch	Either of the read thumb switches on the operator's sight can be used to signal target acquisition and end the run.
8	C.U. cockpit zoom in to ECU track stick	On the operator's left is the track stick, (P) used to control and point the sensor in the aided experiments, and to record when you have acquired the target for the direct vision experiment. The trigger switch (P), actuated by the index finger, indicates that you have identified the targets and ends the experimental run.

VIDEO		AUDIO
9	Pan RT to ECU TV display and zoom out to C.U. cockpit	Located directly in front of you (P) is a video display unit. This unit is used in the TV aided experiments only and will be turned off for direct visual and optical aided runs.
10	C.S cockpit and experimenter station.	Located to the pilot's left (P) is the experimenter's station where the experimenter will record the test data.
	(FADE OUT) (FADE IN)	
11	Overall shot Terrain Model	You will be brought to a simulated elevation and fixed in a simulated hover position. The terrain table will be positioned at a fixed range. The curtain will be lifted in front of you and remain open (for one minute) or until you find the target.
12	MS village on terrain model (Color Run #1) (Location 1)	Our target for this first demonstration run is a group of three tanks which are heading southeast, near the village you previously saw. You are looking north from a hovering elevation of 400 meters and a range of 4.2 kilometers. The scene is scaled at 200:1. We will zoom in on the target with the TV. Now you should be able to see the tanks clearly.
13	Black and white (Run #1, Location 1)	The TV aided portion of the experiment will be conducted using black/white TV imagery. Let's repeat the previous scene using the black/white TV system you will be using. We will zoom in on the target with the TV aid some of you will be using.
14	Color Run 2 Shoot to tank on hill (Location 2)	Now we will run a series of color and B/W runs at various target locations. In this case, a tank is located on the hillside, overlooking a crossroad. The hovering elevation is 600 meters and the range is 4.2 kilometers.
15	B&W, Location 2	Now let's repeat the scene with the black and white camera and zoom in on the target.
16	Color Run #3 Location 3	In this run the target should be a bit easier to find. The tanks are in the southeast sector to the left of the north/south road and just below the main east/west road.

	VIDEO	AUDIO
17	Black & white Run 3 Location 3	In this B&W run, it is as easy, or perhaps easier, to acquire the target, especially with the zoom lens. The tank targets are at a simulated range of approximately 2800 meters. In these runs, the helicopter simply rises to altitude and our camera zooms in on the target.
18	Color Run 4 Location 4	Here the target is located in a group of bushes in a direct line over the east/west road on the east side of our sector. Two tanks have forded the stream.
19	Black & White Location 4	In the black and white run we are searching for the targets with the TV aid. When we find the tank, it's quite obvious.
20	Close up of tanks Location 4	From these demonstrations we have seen that the targets vary in color and contrast, making some targets more difficult to spot than others.
21	Overall shot over terrain to simulator zoom in to cockpit module	The previous illustration runs have been shown so that you will have some idea of what will be required of you during the experiments. The video program has also shown you the environment you will be working in. Your participation in this experiment is essential to the scientific evaluation of some of the key factors in target acquisition. The success of our joint efforts depends on your active and efficient performance in our simulation of the combat air support target acquisition process. Thank you for your participation.
22	TITLE: Martin Marietta	

SEEKVAL EXPERIMENT IB1
PROCEDURE SVIB1-1D
ROTARY-WING MISSION BRIEFING EXHIBIT V

Here on the wall is a photograph of our terrain model. The model is 12 meters by 12 meters. This photograph is an oblique view representing what you will see from the cockpit simulator as you approach your target area. The photograph is divided into four different target areas. You will search for your targets one area at a time. Your targets will be only tanks. They will be exactly the size of the tanks you see on the model here. The tanks will always be on the open terrain, although some clutter may be around them, and never in the heavily forested areas. You will be flying over a free-fire zone. Any tank you see in the particular area you are searching is a target.

You will carry with you in your cockpit a copy of this photograph with the four target areas outlined, to be used as a mission briefing. You will first search in area one, then two, three and four. The map above is a top view of the same terrain with the four target areas outlined. It shows topographical features of the terrain. On the sides are close-up view photographs of the four target areas.

As you saw in the film, your cockpit will be brought to a simulated altitude with the curtain down. The terrain is set at a fixed range. The curtain is lifted in front of you and we start timing you. You search for the targets until you find them or for a maximum of one minute. This simulates helicopter pop-up maneuvers.

When you see your target you signal acquisition by pressing the trigger on the control stick or the thumb switches on the sighting station. You signal acquisition when you are sure enough of your target's location that you are willing to commit ordnance. (Remember that the "enemy" could be shooting back.)

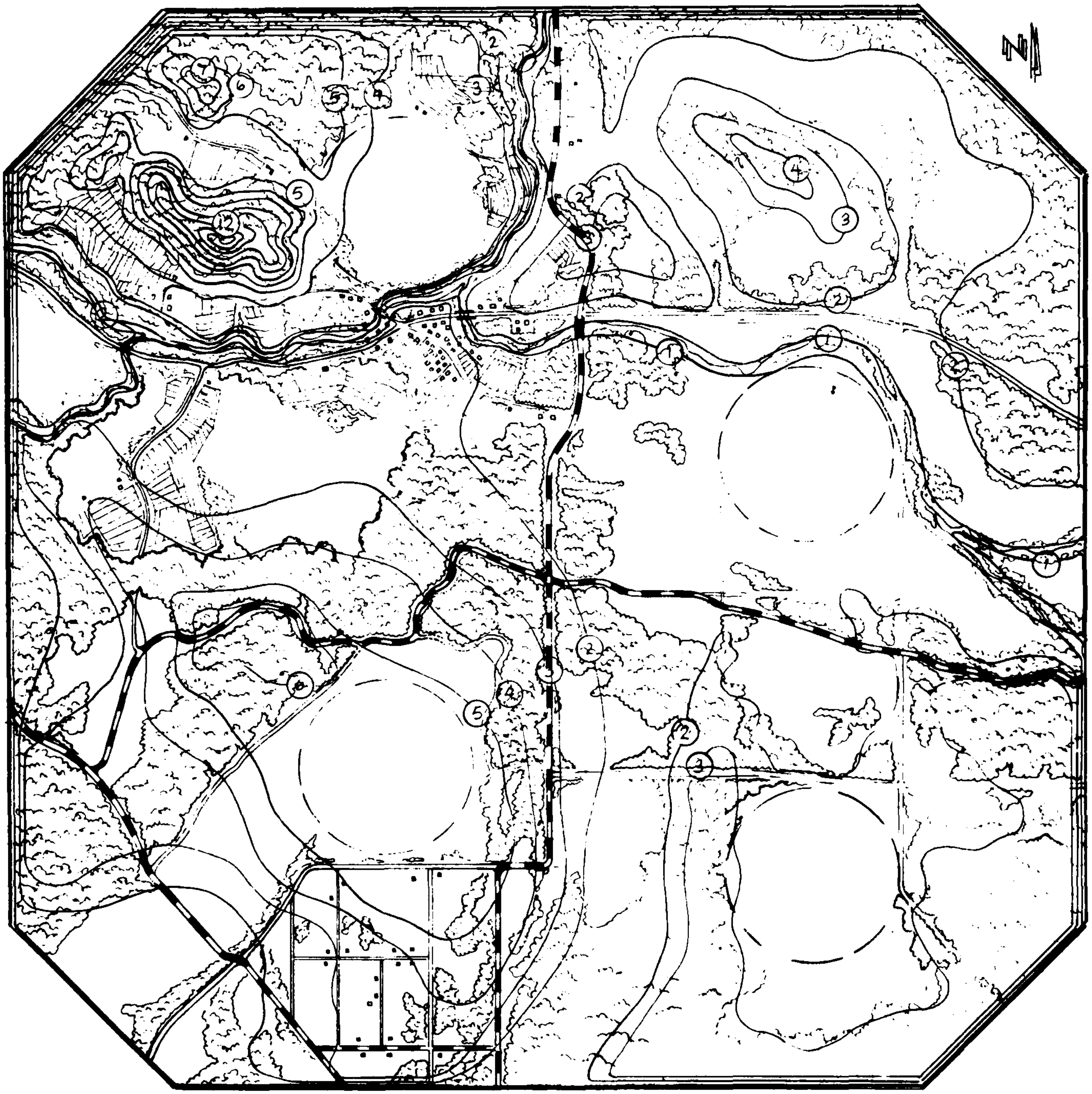

Exhibit VI. Terrain Table Map

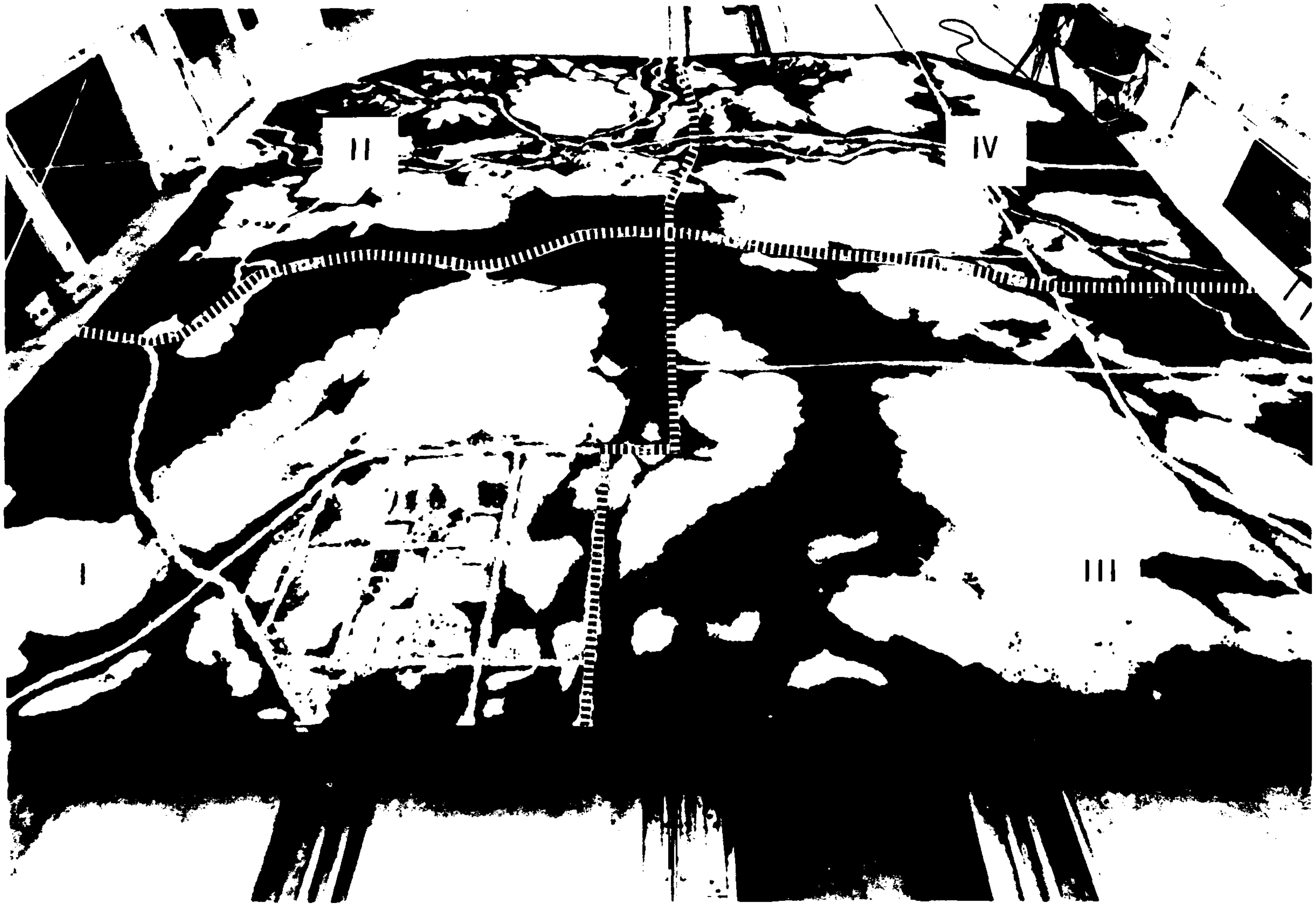

Exhibit VII. Terrain Table Overall View

Exhibit VIII. Target Area I

Exhibit IX. Target Area II

Exhibit X . Target Area III

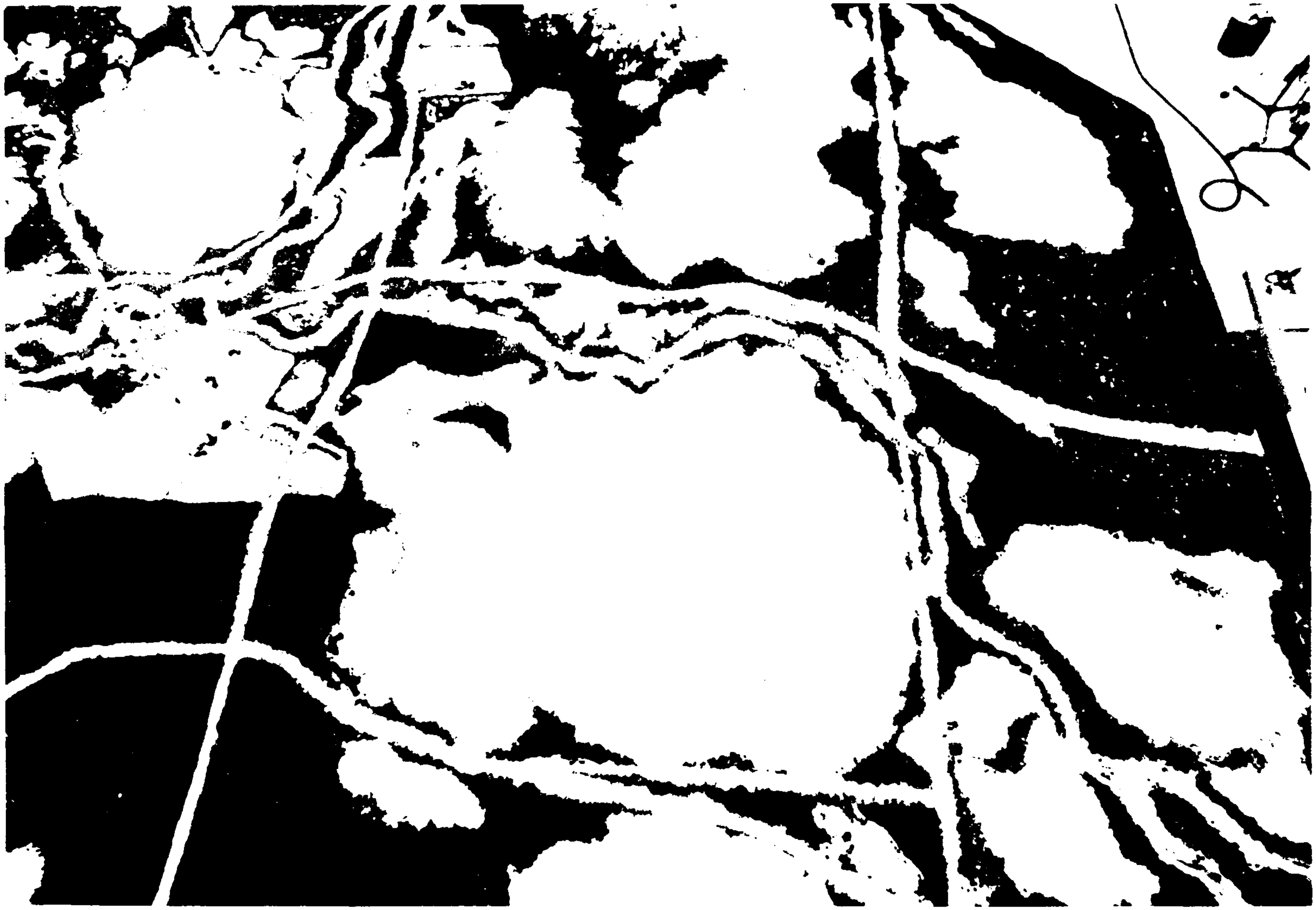

Exhibit XI. Target Area IV

ROTARY-WING TARGET AREA DESCRIPTION EXHIBIT XII

Area I is on the SW corner of the terrain model. It is bounded on the east by the N-S highway that runs through the center of the model, and on the north by the E-W highway that runs through the heavily wooded area.

Area II is on the NW corner of the terrain model. It is bounded on the east by the N-S highway that runs through the center of the model, and on the south by the E-W highway that runs through the heavily wooded area.

Area III is on the SE corner of the terrain model. It is bounded on the west by the N-S highway that runs through the center of the model, and on the north by the E-W highway that divides the model.

Area IV is on the NE corner of the terrain model. It is bounded on the west by the N-S highway that runs through the center of the model, and on the south by the E-W highway that divides the model.

Immediately the curtain comes down in front of you, the run stops and the time it took you to spot your target is recorded by the computer.

While the curtain is down, the cockpit and terrain will be repositioned for the next run. During this time your Experimenter will ask you questions about the target you just saw. You can show him by pointing out on your photograph, the location of the targets, the number of tanks that you saw, the color of the tanks, and, if you were close enough to tell, the direction in which the tanks were headed.

Although there may be more than one tank per target area, you trigger-off only once per run.

Your cockpit will be positioned either left or right, depending on which side of the terrain you are searching for targets in.

Are there any questions on what we have talked about so far?

Now, using the mockup, I will demonstrate what you will do in your cockpit. Each one of you will use one of the three difffeent search methods: direct vision, in which you look directly at the terrain and when you see the target you press the trigger; direct vision aided by a stabilized telescope; and direct vision aided by the TV sensor with the zoom lens capability.

(At this point tell each observer what type of search method they will use.)

(Call out the first name and demonstrate equipment. Example:)

Direct Vision:

You will enter your cockpit and sit on a seat identical to this one; you will fasten the safety straps. When the curtain comes up, you look directly on the terrain. When you see the target you use the trigger switch on the control stick to signal acquisition. The TV screen in front of you will be off.

(Call out the next observer and demonstrate equipment. Example:)

Optical Aid

You look directly at the terrain when the curtain comes up. The telescope

is an aid and you do not have to use it. When you see the target, you use either of the thumb switches to signal acquisition and stop the run.

If you see something and you are not certain it is a target, then you may want to use the optical aid. Bring it up to your eye level. When you see your target, trigger off. Before you start your run, you will get a chance to adjust the telescope to your individual eye sight and to focus it. Once in focus, it remains the same for all four runs.

(Call out the next observer and demonstrate equipment. Example:)

TV Aid

Again you look directly at the terrain when the curtain comes up. When you see the target, use either of the thumb switches to signal acquisition and stop the run.

If you want to verify that what you see is the target, you may want to use the TV aid.

The TV sensor is linked to the sight. You will see a cross-hair projected on the slanted glass on the sight. Whatever you aim the cross-hair on will be projected on the TV screen in front of you.

To look at your TV screen, first aim the cross-hair at the possible target. Press either index switch and the TV sensor locks-in on the target. Now you can let the sighting station down so you can see the TV screen. You can control the TV sensor by moving the stick on your left. The center knob controls the field of view of the TV aid. Use the trigger switch on the control stick to signal acquisition while looking at your TV.

If you did not see the target and want to return to searching through direct vision, bring up the sighting station to look through the cross-hair and press either lower switch. The TV sensor will again be slaved to the sight. You can switch back and forth any number of times. However, time is important, so if you see the target in any mode, try to signal acquisition without switching to a different mode of search, since this will cost you time.

For those of you who will be using the aids, you will get a chance to "play" with them before you start your runs so that you will be fully familiar with their operation. Remember that the aids are just that, aids. You do not have to use them if you find you can do better without them. If there are no more questions we will go to the Holding Room which is right outside the lab. There you will wait for your Experimenter. You will not return to this room, so take all personal belongings with you.

(Observers are transferred to Holding Room.)

SEEKVAL EXPERIMENT IB1
PROCEDURE SVIB1-4B
ROTARY WING RUN BRIEFING EXHIBIT XIII

You have reviewed the briefing materials and should be familiar with the map and aerial photos of the target area.

Remember that the target area is a free-fire zone. Any tanks you may find in the areas can be fired upon. In this experiment we will ask you to find tanks as targets. When any particular target has been found to your satisfaction place the sight reticle (for SO missions, the telescope, for EO missions, the pantograph sight) on the target and keep it there when you press the event marker switch. Do not press the switch until you have found the target and are ready to end the run. On the track stick in your left hand is the event marker switch (for SO and EO missions, the two push-buttons on the pantograph handles are also available) for Direct View Missions. When you depress these switches (or any of them) you are indicating that you have found the target. This means that you have found a target and are sure enough of its location that you are willing to attack. When you depress these switches (or any one of them) the run ends.

When the run begins this curtain will rise out of the way and you can see the area of operations. First find the area in which your target should be located, then begin your search for tanks. When you find any tanks be sure to keep the sight reticle or instrument on them.

When you have found the target depress the indicator switch.

That terminates the run. The curtain will drop in front of you. I will then ask you some questions about the target to help verify some of the data we are collecting.

If by chance you have not found the target in time the curtain will close and that also ends the run.

Meanwhile you are repositioned and the setup for the next run is prepared and verified.

I will brief you on the next target and we repeat the sequence.

Here is the aerial photograph of our general operational area. Keep it for all flights. On this mission enemy tanks have been reported in this area of your zone of operations. The target area is described as: [The Observer is handed the photograph (Exhibit VII), and for each run the appropriate area description from Exhibit XII is provided verbally.]

Do you have any questions about how we will operate?

Do you understand how your equipment operates? In this test you will search for targets using direct vision. (*If this is an aided mission, the comments below are inserted at this point). Do not press the switch until you have found the target and are ready to end the run.

Are you ready? (To test conductor) Experimenter ready!

---

*(In the case of SO):

In addition, you have the option of using the binocular unit mounted on the pantograph sight. You will not be using the pantograph sight itself. We will be operating at ( ) range and have to focus the binocular for that range. That target (or bolt or column) over there is at the correct range. (The Observer is assisted in focusing). That panel on the easel in front of you, there, was placed to prevent inadvertent observation of the target area on the terrain model; so feel free to check out the binocular.

(In the case of EO):

In addition, you have the option of using the TV system as an aid. The recommended way of using this system is as follows: (1) Look through the sight system on the pantograph and identify a suspicious target area; with the pantograph pointed at the area, press either upper trigger on the pantograph handles; the TV is now locked on the area and control has been transferred to the track-stick. Swing the pantograph out of way and, looking at the TV display, home-in on the presumed target with the track-stick. If it turns out that there is not a target there, the whole procedure can be reinstituted by pressing either lower trigger on either pantograph handle, returning control to the pantograph. I suggest you practice shifting back and forth from one control or another using the marks on the panel on the easel in front of you. (This practice was continued for about a minute and then the regular procedure was resumed).

SEEKVAL EXPERIMENT IB1
PROCEDURE SVIB1-8
MISSION DEBRIEFING EXHIBIT XIV

Thank you for participating in this series of SEEKVAL experiments.

As I told you when we first began our runs, there are no right answers. The tests have been designed not as a performance measure but as an experiment. In general, your mission has been to find tank targets in terrain typical of central Europe. We have, as you have seen, varied locations and other factors related to the target. Our objective has been to secure baseline data that will be useful in future operations. As near as I can tell, your personal performance was very good. The results will help us very much.

You will, I'm certain, have a chance to discuss what you saw and did here today with other members of your unit (or other employees at Martin Marietta). We ask you, in the name of good scientific research, not to talk about what you saw and did in any detail. The name of this game is research. In the good name of science we ask you to not discuss your results with others. It is vital to the experiment that all participants start out with essentially the same knowledge about the terrain and the operations that are being conducted. If you talk too much about the situation, especially to those who have not had their turn you could well invalidate the results. Particularly, the layout of the terrain and the targets locations are sensitive and should not be talked about.

You should also know that not everyone is doing the same thing. Each group of participants here will perform a different set of missions. While the terrain in which you searched for our tank targets is the same for

everyone the procedure used and the targets are not always the same. Thus even if you "compare notes" with some other participants you may find out he did not do what you did. When you do this, some future participant may hear you.

Thank you again. Your part is done. You may now return to your duties. Please do not go back to the reception and briefing area. (Military personnel may wait in the Debriefing Room, but not in the Ready Room. If you desire, I will escort you there.)

Number:
Name:

SEEKVAL HELICOPTER DEBRIEFING QUESTIONNAIRE EXHIBIT XV

Please help us with this study by answering the following questions honestly and candidly.

1. Was the visual scene (terrain model, target area and targets) a realistic simulation? Yes No
   Comments ________________________________

____

____

2. Did the target area briefings help you? Yes No
   Comments ________________________________

____

3. Was the general information briefing and taped TV presentation helpful in showing you what to expect? Yes No
   Comments ________________________________

____

____

4. In some test runs a stabilized optic (monocular telescope) was available.
   Did you have a stabilized optical aid? Yes No
   If yes, please answer the following:
   Did you use the telescope at all? Yes No
   Did the telescope help you find targets? Yes No
   Did the sighting station mount help you use the telescope? Yes No
   Comments ________________________________

____

____

5. In some test runs a television was available. Did you have a TV?
   Yes No
   If yes, please answer the following:
   a. Did you use the TV at all? Yes No
   b. Did the TV help you find targets? Yes No
   c. Did the Operators sight help you use the TV? Yes No
   d. Was the track stick helpful in using the TV? Yes No
   Comments ________________________________

____

____

6. What suggestions can you make to help improve this test?

____

____

____

APPENDIX K

Experimental Data

The experimental data was listed on cards in the format shown below and a sample data card is included. The following pages list the experimental data by sub-experiment.

SEEKVAL DATA CARD DESCRIPTION

GENERAL FORMAT

CARD COLUMN X 10 :

```
                 1             2               3                 4                  5                6               7              8
NNNN.N  A  NNNN  AA  A  AA  AA  NNN  NNN  NNNN  AA  AA  N  NNNNN  N  N  NNN.N  AAAAAAA  N  NNNN.N
```

Format	Field
NNNN.N	SERIAL NUMBER
A	TRAINING
NNNN	DATE
AA	MODE
A	TABLE SETUP
AA	METHOD
AA	CONTRAST/CLUTTER
NNN	SUN ELEVATION
NNN	SUN AZIMUTH
NNNN	ALTITUDE
AA	TARGET COLOR
AA	BACKGROUND COLOR
N	TARGETS IN ZONE
NNNNN	ACQUISITION RANGE
N	GOOD TARGETS
N	BAD TARGETS
NNN.N	ACQUISITION TIME
AAAAAAA	UMPIRE NAME
N	REMARK CODE
NNNN.N	RUN ID

WHERE N = DECIMAL NUMBER
A = ALPHABETIC CHARACTER

SAMPLE DATA CARDS OF RUN 1001.

```
4014.1 T 1210 FW A DV LL 40 180 3000 BD GR 3 04541 0 1 054.0 ROMANS   1001.1
5014.1 T 1210 FW A DV ML 40 180 3000 BD GR 3 04451 0 1 057.0 ROMANS   1001.2
6014.1 T 1210 FW A DV HL 40 180 3000 BD GR 3 02460 0 1 066.0 ROMANS   1001.3
1014.1 T 1210 FW A DV LH 40 180 3000 BD GR 3 01517 0 0 064.0 ROMANS   1001.4
2014.1 T 1210 FW A DV MH 40 180 3000 BD GR 3 01732 3 1 072.0 ROMANS   1001.5
3014.1 T 1210 FW A DV HH 40 180 3000 BD GR 3 02087 0 0 071.0 ROMANS   1001.6
```

****** DATA FRØM SEEKVAL EXPERIMENT 1 ******

4014.1	T	1210	FW	A	DV	LL	40	180	3000	ØD	GR	3	04541	0	1	054.0	RØMANS	1001.1
5014.1	T	1210	FW	A	DV	ML	40	180	3000	ØD	GR	3	04451	0	1	057.0	RØMANS	1001.2
6014.1	T	1210	FW	A	DV	HL	40	180	3000	ØD	GR	3	02460	0	1	066.0	RØMANS	1001.3
1014.1	T	1210	FW	A	DV	LH	40	180	3000	ØD	GR	3	01517	0	0	064.0	RØMANS	1001.4
2014.1	T	1210	FW	A	DV	MH	40	180	3000	ØD	GR	3	01732	3	1	072.0	RØMANS	1001.5
3014.1	T	1210	FW	A	DV	HH	40	180	3000	ØD	GR	3	02087	0	0	071.0	RØMANS	1001.6
4009.2	U	1209	FW	A	DV	LL	40	180	3000	ØD	GR	3	01038	0	0	092.0	RØMANS	1002.1
5009.2	U	1209	FW	A	DV	ML	40	180	3000	ØD	GR	3	01457	0	0	072.0	RØMANS	1002.2
6009.2	U	1209	FW	A	DV	HL	40	180	3000	ØD	GR	3	03923	3	0	058.0	RØMANS	1002.3
1009.2	U	1209	FW	A	DV	LH	40	180	3000	ØD	GR	3	04237	0	1	046.0	RØMANS	1002.4
2009.2	U	1209	FW	A	DV	MH	40	180	3000	ØD	GR	3	06672	0	1	043.0	RØMANS	1002.5
3009.2	U	1209	FW	A	DV	HH	40	180	3000	ØD	GR	3	03268	3	0	063.0	RØMANS	1002.6
1015.1	T	1210	FW	A	NF	LL	40	180	3000	ØD	GR	3	01669	0	0	067.0	SEARS	1003.1
2015.1	T	1210	FW	A	NF	ML	40	180	3000	ØD	GR	3	02204	0	0	065.0	SEARS	1003.2
3015.1	T	1210	FW	A	NF	HL	40	180	3000	ØD	GR	3	05568	3	0	050.0	SEARS	1003.3
4015.1	T	1210	FW	A	NF	LH	40	180	3000	ØD	GR	3	01199	0	0	062.0	SEARS	1003.4
5015.1	T	1210	FW	A	NF	MH	40	180	3000	ØD	GR	3	00974	0	0	075.0	SEARS	1003.5
6015.1	T	1210	FW	A	NF	HH	40	180	3000	ØD	GR	3	02180	0	0	064.0	SEARS	1003.6
1010.2	U	1209	FW	A	NF	LL	40	180	3000	ØD	GR	3	04945	0	1	050.0	SEARS	1004.1
2010.2	U	1209	FW	A	NF	ML	40	180	3000	ØD	GR	3	02076	0	0	069.0	SEARS	1004.2
3010.2	U	1209	FW	A	NF	HL	40	180	3000	ØD	GR	3	06166	0	1	046.0	SEARS	1004.3
4010.2	U	1209	FW	A	NF	LH	40	180	3000	ØD	GR	3	02305	0	0	057.0	SEARS	1004.4
5010.2	U	1209	FW	A	NF	MH	40	180	3000	ØD	GR	3	06719	0	1	042.0	SEARS	1004.5
6010.2	U	1209	FW	A	NF	HH	40	180	3000	ØD	GR	3	02634	0	0	065.0	SEARS	1004.6
4016.1	T	1210	FW	A	WF	LL	40	180	3000	ØD	GR	3	04059	0	1	054.0	RØMANS	1005.1
5016.1	T	1210	FW	A	WF	ML	40	180	3000	ØD	GR	3	01723	0	0	070.0	RØMANS	1005.2
6016.1	T	1210	FW	A	WF	HL	40	180	3000	ØD	GR	3	02550	2	0	065.0	RØMANS	1005.3
1016.1	T	1210	FW	A	WF	LH	40	180	3000	ØD	GR	3	01519	0	0	061.0	RØMANS	1005.4
2016.1	T	1210	FW	A	WF	MH	40	180	3000	ØD	GR	3	00968	0	0	076.0	RØMANS	1005.5
3016.1	T	1210	FW	A	WF	HH	40	180	3000	ØD	GR	3	01658	0	0	069.0	RØMANS	1005.6
4011.2	U	1209	FW	A	WF	LL	40	180	3000	ØD	GR	3	02761	3	0	062.0	RØMANS	1006.1
5011.2	U	1209	FW	A	WF	ML	40	180	3000	ØD	GR	3	01743	0	0	070.0	RØMANS	1006.2
6011.2	U	1209	FW	A	WF	HL	40	180	3000	ØD	GR	3	01757	0	0	070.0	RØMANS	1006.3
1011.2	U	1209	FW	A	WF	LH	40	180	3000	ØD	GR	3	04757	3	0	044.0	RØMANS	1006.4
2011.2	U	1209	FW	A	WF	MH	40	180	3000	ØD	GR	3	00999	0	0	077.0	RØMANS	1006.5
3011.2	U	1209	FW	A	WF	HH	40	180	3000	ØD	GR	3	04308	0	3	055.0	RØMANS	1006.6
1018.1	T	1210	FW	A	VF	LL	40	180	3000	ØD	GR	3	10317	3	0	023.0	SEARS	1007.1
2018.1	T	1210	FW	A	VF	ML	40	180	3000	ØD	GR	3	03305	3	0	062.0	SEARS	1007.2
3018.1	T	1210	FW	A	VF	HL	40	180	3000	ØD	GR	3	02481	0	0	066.0	SEARS	1007.3
4018.1	T	1210	FW	A	VF	LH	40	180	3000	ØD	GR	3	11918	3	0	007.0	SEARS	1007.4
5018.1	T	1210	FW	A	VF	MH	40	180	3000	ØD	GR	3	04691	3	0	053.0	SEARS	1007.5
6018.1	T	1210	FW	A	VF	HH	40	180	3000	ØD	GR	3	02252	0	0	068.0	SEARS	1007.6
1017.2	U	1210	FW	A	VF	LL	40	180	3000	ØD	GR	3	03607	3	0	061.0	SEARRS	1008.1
2017.2	U	1210	FW	A	VF	ML	40	180	3000	ØD	GR	3	03098	3	1	066.0	SEARRS	1008.2
3017.2	U	1210	FW	A	VF	HL	40	180	3000	ØD	GR	3	03235	0	0	065.0	SEARRS	1008.3
4017.2	U	1210	FW	A	VF	LH	40	180	3000	ØD	GR	3	06093	3	0	038.0	SEARRS	1008.4
5017.2	U	1210	FW	A	VF	MH	40	180	3000	ØD	GR	3	01008	0	0	082.0	SEARRS	1008.5
6017.2	U	1210	FW	A	VF	HH	40	180	3000	ØD	GR	3	02283	0	0	070.0	SEARRS	1008.6
2019.1	T	1210	FW	A	DV	LL	40	90	3000	ØD	GR	3	05637	0	1	047.0	RØMANS	1009.1
3019.1	T	1210	FW	A	DV	ML	40	90	3000	ØD	GR	3	02693	3	0	068.0	RØMANS	1009.2
1019.1	T	1210	FW	A	DV	HL	40	90	3000	ØD	GR	3	02149	0	0	067.0	RØMANS	1009.3

4019.1	T	1210	FW	A	DV	LH	40	90	3000	0D	GR	3	01798	0	0	061.0	RBMANS	1009.4
5019.1	T	1210	FW	A	DV	MH	40	90	3000	0D	GR	3	02160	0	2	071.0	RBMANS	1009.5
6019.1	T	1210	FW	A	DV	HH	40	90	3000	0D	GR	3	03012	1	0	063.0	RBMANS	1009.6
4022.2	U	1211	FW	A	DV	LL	40	90	3000	0D	GR	3	03792	1	2	055.0	SEARS	1010.1
5022.2	U	1211	FW	A	DV	ML	40	90	3000	0D	GR	3	03713	2	1	057.0	SEARS	1010.2
6022.2	U	1211	FW	A	DV	HL	40	90	3000	0D	GR	3	03054	3	0	062.0	SEARS	1010.3
2022.2	U	1211	FW	A	DV	LH	40	90	3000	0D	GR	3	06179	3	0	036.0	SEARS	1010.4
3022.2	U	1211	FW	A	DV	MH	40	90	3000	0D	GR	3	03045	3	0	061.0	SEARS	1010.5
1022.2	U	1211	FW	A	DV	HH	40	90	3000	0D	GR	3	02131	0	0	067.0	SEARS	1010.6
2021.1	T	1210	FW	A	NF	LL	40	90	3000	0D	GR	3	02717	3	2	063.0	RBMANS	1011.1
3021.1	T	1210	FW	A	NF	ML	40	90	3000	0D	GR	3	02918	3	0	065.0	RBMANS	1011.2
1021.1	T	1210	FW	A	NF	HL	40	90	3000	0D	GR	3	02189	3	0	068.0	RBMANS	1011.3
4021.1	T	1210	FW	A	NF	LH	40	90	3000	0D	GR	3	01882	0	1	062.0	RBMANS	1011.4
5021.1	T	1210	FW	A	NF	MH	40	90	3000	0D	GR	3	02094	0	0	075.0	RBMANS	1011.5
6021.1	T	1210	FW	A	NF	HH	40	90	3000	0D	GR	3	02530	0	2	067.0	RBMANS	1011.6
4024.1	U	1211	FW	A	NF	LL	40	90	3000	0D	GR	3	09312	3	0	027.0	SEARS	1012.1
5024.1	U	1211	FW	A	NF	ML	40	90	3000	0D	GR	3	05370	0	2	049.0	SEARS	1012.2
6024.1	U	1211	FW	A	NF	HL	40	90	3000	0D	GR	3	03804	3	0	056.0	SEARS	1012.3
2024.1	U	1211	FW	A	NF	LH	40	90	3000	0D	GR	3	07007	3	0	031.0	SEARS	1012.4
3024.1	U	1211	FW	A	NF	MH	40	90	3000	0D	GR	3	06161	3	1	044.0	SEARS	1012.5
1024.1	U	1211	FW	A	NF	HH	40	90	3000	0D	GR	3	02122	3	0	067.0	SEARS	1012.6
4020.1	T	1210	FW	A	WF	LL	40	90	3000	0D	GR	3	12440	3	0	012.0	SEARS	1013.1
5020.1	T	1210	FW	A	WF	ML	40	90	3000	0D	GR	3	04797	3	0	055.0	SEARS	1013.2
6020.1	T	1210	FW	A	WF	HL	40	90	3000	0D	GR	3	02332	0	0	066.0	SEARS	1013.3
2020.1	T	1210	FW	A	WF	LH	40	90	3000	0D	GR	3	10867	3	0	016.0	SEARS	1013.4
3020.1	T	1210	FW	A	WF	MH	40	90	3000	0D	GR	3	05106	3	1	055.0	SEARS	1013.5
1020.1	T	1210	FW	A	WF	HH	40	90	3000	0D	GR	3	02239	0	0	067.0	SEARS	1013.6
2025.2	U	1211	FW	A	WF	LL	40	90	3000	0D	GR	3	03967	3	0	055.0	SEARS	1014.1
3025.2	U	1211	FW	A	WF	ML	40	90	3000	0D	GR	3	04577	0	0	054.0	SEARS	1014.2
1025.2	U	1211	FW	A	WF	HL	40	90	3000	0D	GR	3	02486	3	0	063.0	SEARS	1014.3
4025.2	U	1211	FW	A	WF	LH	40	90	3000	0D	GR	3	04509	3	0	045.0	SEARS	1014.4
5025.2	U	1211	FW	A	WF	MH	40	90	3000	0D	GR	3	02210	0	0	069.0	SEARS	1014.5
6025.2	U	1211	FW	A	WF	HH	40	90	3000	0D	GR	3	02125	0	0	066.0	SEARS	1014.6
2023.1	T	1211	FW	A	VF	LL	40	90	3000	0D	GR	3	03076	3	0	061.0	RBMANS	1015.1
3023.1	T	1211	FW	A	VF	ML	40	90	3000	0D	GR	3	04918	3	1	053.0	RBMANS	1015.2
1023.1	T	1211	FW	A	VF	HL	40	90	3000	0D	GR	3	01946	0	0	068.0	RBMANS	1015.3
4023.1	T	1211	FW	A	VF	LH	40	90	3000	0D	GR	3	05707	3	0	039.0	RBMANS	1015.4
5023.1	T	1211	FW	A	VF	MH	40	90	3000	0D	GR	3	04614	3	5	053.0	RBMANS	1015.5
6023.1	T	1211	FW	A	VF	HH	40	90	3000	0D	GR	3	02147	0	0	067.0	RBMANS	1015.6
2027.1	U	1212	FW	A	VF	LL	40	90	3000	0D	GR	3	07937	3	0	034.0	SEARS	1016.1
3027.1	U	1212	FW	A	VF	ML	40	90	3000	0D	GR	3	03755	3	0	059.0	SEARS	1016.2
1027.1	U	1212	FW	A	VF	HL	40	90	3000	0D	GR	3	02656	0	0	063.0	SEARS	1016.3
4027.1	U	1212	FW	A	VF	LH	40	90	3000	0D	GR	3	08941	3	0	023.0	SEARS	1016.4
5027.1	U	1212	FW	A	VF	MH	40	90	3000	0D	GR	3	02206	0	0	068.0	SEARS	1016.5
6027.1	U	1212	FW	A	VF	HH	40	90	3000	0D	GR	3	02147	0	0	067.0	SEARS	1016.6
4026.1	T	1212	FW	A	DV	LL	32	135	3000	0D	GR	3	05696	3	0	046.0	RBMANS	1017.1
5026.1	T	1212	FW	A	DV	ML	40	135	3000	0D	GR	3	03592	0	1	059.0	RBMANS	1017.2
6026.1	T	1212	FW	A	DV	HL	40	135	3000	0D	GR	3	02180	0	0	067.0	RBMANS	1017.3
1026.1	T	1212	FW	A	DV	LH	32	135	3000	0D	GR	3	03797	3	0	047.0	RBMANS	1017.4
2026.1	T	1212	FW	A	DV	MH	40	135	3000	0D	GR	3	01232	0	0	072.0	RBMANS	1017.5
3026.1	T	1212	FW	A	DV	HH	40	135	3000	0D	GR	3	01887	0	0	069.0	RBMANS	1017.6
1031.2	U	1212	FW	A	DV	LL	32	135	3000	0D	GR	3	04685	1	0	050.0	SEARS	1018.1
2031.2	U	1212	FW	A	DV	ML	40	135	3000	0D	GR	3	01853	0	0	068.0	SEARS	1018.2

3031.2	U	1212	FW	A	DV	HL	40	135	3000	ØD	GR	3	02929	0	0	061.0	SEARS	1018.3
4031.2	U	1212	FW	A	DV	LH	32	135	3000	ØD	GR	3	03663	3	0	048.0	SEARS	1018.4
5031.2	U	1212	FW	A	DV	MH	40	135	3000	ØD	GR	3	01018	0	0	074.0	SEARS	1018.5
6031.2	U	1212	FW	A	DV	HH	40	135	3000	ØD	GR	3	02717	3	0	063.0	SEARS	1018.6
4028.1	T	1212	FW	A	NF	LL	32	135	3000	ØD	GR	3	04918	3	0	047.0	RØMANS	1019.1
5028.1	T	1212	FW	A	NF	ML	40	135	3000	ØD	GR	3	01536	0	0	066.0	RØMANS	1019.2
6028.1	T	1212	FW	A	NF	HL	40	135	3000	ØD	GR	3	01942	0	0	065.0	RØMANS	1019.3
1028.1	T	1212	FW	A	NF	LH	32	135	3000	ØD	GR	3	01545	0	0	059.0	RØMANS	1019.4
2028.1	T	1212	FW	A	NF	MH	40	135	3000	ØD	GR	3	04583	0	1	051.0	RØMANS	1019.5
3028.1	T	1212	FW	A	NF	HH	40	135	3000	ØD	GR	3	02325	0	0	064.0	RØMANS	1019.6
4032.2	U	1212	FW	A	NF	LL	32	135	3000	ØD	GR	3	06296	3	0	042.0	RØMANS	1020.1
5032.2	U	1212	FW	A	NF	ML	40	135	3000	ØD	GR	3	01492	0	0	068.0	RØMANS	1020.2
6032.2	U	1212	FW	A	NF	HL	40	135	3000	ØD	GR	3	02118	0	0	066.0	RØMANS	1020.3
1032.2	U	1212	FW	A	NF	LH	32	135	3000	ØD	GR	3	01455	3	0	026.0	RØMANS	1020.4
2032.2	U	1212	FW	A	NF	MH	40	135	3000	ØD	GR	3	00977	0	0	071.0	RØMANS	1020.5
3032.2	U	1212	FW	A	NF	HH	40	135	3000	ØD	GR	3	03136	0	2	058.0	RØMANS	1020.6
1029.1	T	1212	FW	A	WF	LL	32	135	3000	ØD	GR	3	03781	3	0	056.0	SEARS	1021.1
2029.1	T	1212	FW	A	WF	ML	40	135	3000	ØD	GR	3	03114	3	0	061.0	SEARS	1021.2
3029.1	T	1212	FW	A	WF	HL	40	135	3000	ØD	GR	3	02770	0	0	062.0	SEARS	1021.3
4029.1	T	1212	FW	A	WF	LH	32	135	3000	ØD	GR	3	01301	0	0	070.0	SEARS	1021.4
5029.1	T	1212	FW	A	WF	MH	40	135	3000	ØD	GR	3	00994	0	0	072.0	SEARS	1021.5
6029.1	T	1212	FW	A	WF	HH	40	135	3000	ØD	GR	3	02860	2	0	061.0	SEARS	1021.6
1033.2	U	1212	FW	A	WF	LL	32	135	3000	ØD	GR	3	10323	1	0	022.0	SEARS	1022.1
2033.2	U	1212	FW	A	WF	ML	40	135	3000	ØD	GR	3	01794	0	0	068.0	SEARS	1022.2
3033.2	U	1212	FW	A	WF	HL	40	135	3000	ØD	GR	3	02579	0	0	063.0	SEARS	1022.3
4033.2	U	1212	FW	A	WF	LH	32	135	3000	ØD	GR	3	01087	0	0	069.0	SEARS	1022.4
5033.2	U	1212	FW	A	WF	MH	40	135	3000	ØD	GR	3	01003	0	0	076.0	SEARS	1022.5
6033.2	U	1212	FW	A	WF	HH	40	135	3000	ØD	GR	3	01933	0	0	068.0	SEARS	1022.6
4030.1	T	1212	FW	A	VF	LL	32	135	3000	ØD	GR	3	09548	0	2	026.0	RØMANS	1023.1
5030.1	T	1212	FW	A	VF	ML	40	135	3000	ØD	GR	3	09874	0	9	026.0	RØMANS	1023.2
6030.1	T	1212	FW	A	VF	HL	40	135	3000	ØD	GR	3	06275	0	1	044.0	RØMANS	1023.3
1030.1	T	1212	FW	A	VF	LH	32	135	3000	ØD	GR	3	01781	0	0	058.0	RØMANS	1023.4
2030.1	T	1212	FW	A	VF	MH	40	135	3000	ØD	GR	3	07470	0	1	038.0	RØMANS	1023.5
3030.1	T	1212	FW	A	VF	HH	40	135	3000	ØD	GR	3	07901	0	4	036.0	RØMANS	1023.6
4034.2	U	1212	FW	A	VF	LL	32	135	3000	ØD	GR	3	06752	0	1	043.0	RØMANS	1024.1
5034.2	U	1212	FW	A	VF	ML	40	135	3000	ØD	GR	3	00000	0	0	00.0	RØMANS	1024.2
6034.2	U	1212	FW	A	VF	HL	40	135	3000	ØD	GR	3	00000	0	0	00.0	RØMANS	1024.3
1034.2	U	1212	FW	A	VF	LH	32	135	3000	ØD	GR	3	02953	0	1	052.0	RØMANS	1024.4
2034.2	U	1212	FW	A	VF	MH	40	135	3000	ØD	GR	3	06465	0	1	043.0	RØMANS	1024.5
3034.2	U	1212	FW	A	VF	HH	40	135	3000	ØD	GR	3	01100	0	2	073.0	RØMANS	1024.6
1002.1	T	1209	FW	A	DV	LL	90	--	3000	ØD	GR	3	06106	0	1	043.0	SEARSSS	1025.1
2002.1	T	1209	FW	A	DV	ML	90	--	3000	ØD	GR	3	02526	0	0	064.0	SEARSSS	1025.2
3002.1	T	1209	FW	A	DV	HL	90	--	3000	ØD	GR	3	03537	0	0	057.0	SEARSSS	1025.3
4002.1	T	1209	FW	A	DV	LH	90	--	3000	ØD	GR	3	03045	3	0	051.0	SEARSSS	1025.4
5002.1	T	1209	FW	A	DV	MH	90	--	3000	ØD	GR	3	02839	3	0	061.0	SEARSSS	1025.5
6002.1	T	1209	FW	A	DV	HH	90	--	3000	ØD	GR	3	02708	0	0	062.0	SEARSSS	1025.6
1001.2	U	1209	FW	A	DV	LL	90	--	3000	ØD	GR	3	01294	0	0	070.0	RØMANS	1026.1
2001.2	U	1209	FW	A	DV	ML	90	--	3000	ØD	GR	3	01843	0	0	068.0	RØMANS	1026.2
3001.2	U	1209	FW	A	DV	HL	90	--	3000	ØD	GR	3	04304	1	0	054.0	RØMANS	1026.3
4001.2	U	1209	FW	A	DV	LH	90	--	3000	ØD	GR	3	01867	0	0	058.0	RØMANS	1026.4
5001.2	U	1209	FW	A	DV	MH	90	--	3000	ØD	GR	3	00986	0	0	075.0	RØMANS	1026.5
6001.2	U	1209	FW	A	DV	HH	90	--	3000	ØD	GR	3	03074	0	1	061.0	RØMANS	1026.6
1003.1	T	1209	FW	A	NF	LL	90	--	3000	ØD	GR	3	01287	0	0	069.0	RØMANS	1027.1

2003.1	T	1209	FW	A	NF	ML	90	--	3000	OD	GR	3	01896	0	0	066.	ROMANS	1027.2
3003.1	T	1209	FW	A	NF	HL	90	--	3000	OD	GR	3	01926	0	0	070.	ROMANS	1027.3
4003.1	T	1209	FW	A	NF	LH	90	--	3000	OD	GR	3	05639	3	0	034.	ROMANS	1027.4
5003.1	T	1209	FW	A	NF	MH	90	--	3000	OD	GR	3	00986	0	0	073.	ROMANS	1027.5
6003.1	T	1209	FW	A	NF	HH	90	--	3000	OD	GR	3	02559	1	0	060.	ROMANS	1027.6
1006.2	U	1209	FW	A	NF	LL	90	--	3000	OD	GR	3	01766	0	0	065.	ROMANS	1028.1
2006.2	U	1209	FW	A	NF	ML	90	--	3000	OD	GR	3	02953	0	0	060.	ROMANS	1028.2
3006.2	U	1209	FW	A	NF	HL	90	--	3000	OD	GR	3	03352	0	0	058.	ROMANS	1028.3
4006.2	U	1209	FW	A	NF	LH	90	--	3000	OD	GR	3	04147	3	0	044.	ROMANS	1028.4
5006.2	U	1209	FW	A	NF	MH	90	--	3000	OD	GR	3	06106	1	0	044.	ROMANS	1028.5
6006.2	U	1209	FW	A	NF	HH	90	--	3000	OD	GR	3	03499	1	0	058.	ROMANS	1028.6
1004.1	T	1209	FW	A	WF	LL	90	--	3000	OD	GR	3	02411	0	3	061.	SEARS	1029.1
2004.1	T	1209	FW	A	WF	ML	90	--	3000	OD	GR	3	07300	0	0	030.	SEARS	1029.2
3004.1	T	1209	FW	A	WF	HL	90	--	3000	OD	GR	3	04460	0	0	053.	SEARS	1029.3
4004.1	T	1209	FW	A	WF	LH	90	--	3000	OD	GR	3	07131	0	0	020.0	SEARS	1029.4
5004.1	T	1209	FW	A	WF	MH	90	--	3000	OD	GR	3	01517	0	0	062.0	SEARS	1029.5
6004.1	T	1209	FW	A	WF	HH	90	--	3000	OD	GR	3	02444	0	0	062.0	SEARS	1029.6
1007.2	U	1209	FW	A	WF	LL	90	--	3000	OD	GR	3	00970	0	0	072.0	ROMANS	1030.1
2007.2	U	1209	FW	A	WF	ML	90	--	3000	OD	GR	3	01860	0	0	066.0	ROMANS	1030.2
3007.2	U	1209	FW	A	WF	HL	90	--	3000	OD	GR	3	01894	0	0	065.0	ROMANS	1030.3
4007.2	U	1209	FW	A	WF	LH	90	--	3000	OD	GR	3	01853	0	0	057.0	ROMANS	1030.4
5007.2	U	1209	FW	A	WF	MH	90	--	3000	OD	GR	3	03464	0	1	057.0	ROMANS	1030.5
6007.2	U	1209	FW	A	WF	HH	90	--	3000	OD	GR	3	03592	0	3	057.0	ROMANS	1030.6
1005.1	T	1209	FW	A	VF	LL	90	--	3000	OD	GR	3	04055	0	1	053.0	ROMANS	1031.1
2005.1	T	1209	FW	A	VF	ML	90	--	3000	OD	GR	3	03290	2	0	055.0	ROMANS	1031.2
3005.1	T	1209	FW	A	VF	HL	90	--	3000	OD	GR	3	04380	0	0	020.	ROMANS	1031.3
4005.1	T	1209	FW	A	VF	LH	90	--	3000	OD	GR	3	01625	0	0	058.0	ROMANS	1031.4
5005.1	T	1209	FW	A	VF	MH	90	--	3000	OD	GR	3	05357	0	0	047.	ROMANS	1031.5
6005.1	T	1209	FW	A	VF	HH	90	--	3000	OD	GR	3	02920	1	0	055.0	ROMANS	1031.6
1008.2	U	1209	FW	A	VF	LL	90	--	3000	OD	GR	3	01532	0	0	067.	SEARS	1032.1
2008.2	U	1209	FW	A	VF	ML	90	--	3000	OD	GR	3	02211	0	0	064.0	SEARS	1032.2
3008.2	U	1209	FW	A	VF	HL	90	--	3000	OD	GR	3	02971	0	0	060.0	SEARS	1032.3
4008.2	U	1209	FW	A	VF	LH	90	--	3000	OD	GR	3	04876	3	0	041.0	SEARS	1032.4
5008.2	U	1209	FW	A	VF	MH	90	--	3000	OD	GR	3	01071	0	0	071.0	SEARS	1032.5
6008.2	U	1209	FW	A	VF	HH	90	--	3000	OD	GR	3	02728	0	0	061.0	SEARS	1032.6
4036.1	T	1213	FW	B	DV	HH	40	180	3000	OD	GR	3	01016	0	0	073.0	ROMANS	1033.1
5036.1	T	1213	FW	B	DV	LL	40	180	3000	OD	GR	3	01871	0	0	068.	ROMANS	1033.2
6036.1	T	1213	FW	B	DV	ML	40	180	3000	OD	GR	3	02131	0	0	065.0	ROMANS	1033.3
1036.1	T	1213	FW	B	DV	HL	40	180	3000	OD	GR	3	01629	0	0	057.0	ROMANS	1033.4
2036.1	T	1213	FW	B	DV	LH	40	180	3000	OD	GR	3	06998	0	1	038.0	ROMANS	1033.5
3036.1	T	1213	FW	B	DV	MH	40	180	3000	OD	GR	3	05813	0	1	046.0	ROMANS	1033.6
1035.2	U	1213	FW	B	DV	HH	40	180	3000	OD	GR	3	00966	0	0	074.0	SEARS	1034.1
2035.2	U	1213	FW	B	DV	LL	40	180	3000	OD	GR	3	10376	1	0	024.0	SEARS	1034.2
3035.2	U	1213	FW	B	DV	ML	40	180	3000	OD	GR	3	03116	1	0	062.0	SEARS	1034.3
4035.2	U	1213	FW	B	DV	HL	40	180	3000	OD	GR	3	00994	0	0	065.0	SEARS	1034.4
5035.2	U	1213	FW	B	DV	LH	40	180	3000	OD	GR	3	01179	0	0	069.0	SEARS	1034.5
6035.2	U	1213	FW	B	DV	MH	40	180	3000	OD	GR	3	02294	0	0	065.0	SEARS	1034.6
1037.1	T	1213	FW	B	NF	HH	40	180	3000	OD	GR	3	01083	0	0	070.0	SEARS	1035.1
2037.1	T	1213	FW	B	NF	LL	40	180	3000	OD	GR	3	04780	1	0	052.0	SEARS	1035.2
3037.1	T	1213	FW	B	NF	ML	40	180	3000	OD	GR	3	05017	3	1	051.0	SEARS	1035.3
4037.1	T	1213	FW	B	NF	HL	40	180	3000	OD	GR	3	07000	3	0	031.0	SEARS	1035.4
5037.1	T	1213	FW	B	NF	LH	40	180	3000	OD	GR	3	07829	0	3	036.0	SEARS	1035.5
6037.1	T	1213	FW	B	NF	MH	40	180	3000	OD	GR	3	06758	3	0	042.0	SEARS	1035.6

1043.2	U	1216	FW	B	NF	HH	40	180	3000	0D	GR	3	01170	0	0	071.0	SEARS	1036.1
2043.2	U	1216	FW	B	NF	LL	40	180	3000	0D	GR	3	01909	0	0	069.0	SEARS	1036.2
3043.2	U	1216	FW	B	NF	ML	40	180	3000	0D	GR	3	03704	2	0	058.0	SEARS	1036.3
4043.2	U	1216	FW	B	NF	HL	40	180	3000	0D	GR	3	08752	3	0	023.0	SEARS	1036.4
5043.2	U	1216	FW	B	NF	LH	40	180	3000	0D	GR	3	08021	3	0	036.0	SEARS	1036.5
6043.2	U	1216	FW	B	NF	MH	40	180	3000	0D	GR	3	10078	0	2	025.0	SEARS	1036.6
4039.1	T	1213	FW	B	WF	HH	40	180	3000	0D	GR	3	03726	0	1	056.0	RBMANS	1037.1
5039.1	T	1213	FW	B	WF	LL	40	180	3000	0D	GR	3	02568	2	0	064.0	RBMANS	1037.2
6039.1	T	1213	FW	B	WF	ML	40	180	3000	0D	GR	3	02005	0	0	067.0	RBMANS	1037.3
1039.1	T	1213	FW	B	WF	HL	40	180	3000	0D	GR	3	01772	0	1	059.0	RBMANS	1037.4
2039.1	T	1213	FW	B	WF	LH	40	180	3000	0D	GR	3	07078	0	1	040.0	RBMANS	1037.5
3039.1	T	1213	FW	B	WF	MH	40	180	3000	0D	GR	3	01580	0	0	071.0	RBMANS	1037.6
1062.3	U	1219	FW	B	WF	HH	40	180	3000	0D	GR	3	06838	0	2	042.5	RBMANS	1038.1
2062.3	U	1219	FW	B	WF	LL	40	180	3000	0D	GR	3	01571	0	0	074.6	RBMANS	1038.2
3062.3	U	1219	FW	B	WF	ML	40	180	3000	0D	GR	3	02307	0	0	069.6	RBMANS	1038.3
4062.3	U	1219	FW	B	WF	HL	40	180	3000	0D	GR	3	01473	0	0	064.2	RBMANS	1038.4
5062.3	U	1219	FW	B	WF	LH	40	180	3000	0D	GR	3	04348	3	0	057.1	RBMANS	1038.5
6062.3	U	1219	FW	B	WF	MH	40	180	3000	0D	GR	3	01796	0	0	074.0	RBMANS	1038.6
1038.1	T	1213	FW	B	VF	HH	40	180	3000	0D	GR	3	01107	0	0	072.0	SEARS	1039.1
2038.1	T	1213	FW	B	VF	LL	40	180	3000	0D	GR	3	03951	3	0	057.0	SEARS	1039.2
3038.1	T	1213	FW	B	VF	ML	40	180	3000	0D	GR	3	02748	0	1	064.0	SEARS	1039.3
4038.1	T	1213	FW	B	VF	HL	40	180	3000	0D	GR	3	06648	0	2	033.0	SEARS	1039.4
5038.1	T	1213	FW	B	VF	LH	40	180	3000	0D	GR	3	11403	0	4	018.0	SEARS	1039.5
6038.1	T	1213	FW	B	VF	MH	40	180	3000	0D	GR	3	02625	0	0	065.0	SEARS	1039.6
4065.3	U	1219	FW	B	VF	HH	40	180	3000	0D	GR	3	09384	1	0	027.2	RBMANS	1040.1
5065.3	U	1219	FW	B	VF	LL	40	180	3000	0D	GR	3	06406	0	1	044.0	RBMANS	1040.2
6065.3	U	1219	FW	B	VF	ML	40	180	3000	0D	GR	3	02025	0	0	066.8	RBMANS	1040.3
1065.3	U	1219	FW	B	VF	HL	40	180	3000	0D	GR	3	06950	0	1	031.6	RBMANS	1040.4
2065.3	U	1219	FW	B	VF	LH	40	180	3000	0D	GR	3	06395	3	0	043.2	RBMANS	1040.5
3065.3	U	1219	FW	B	VF	MH	40	180	3000	0D	GR	3	07417	0	3	038.4	RBMANS	1040.6
3057.1	T	1217	FW	B	DV	HH	40	90	3000	0D	GR	3	00960	0	0	076.4	SEARS	1041.1
1057.1	T	1217	FW	B	DV	LL	40	90	3000	0D	GR	3	02955	3	0	063.0	SEARS	1041.2
2057.1	T	1217	FW	B	DV	ML	40	90	3000	0D	GR	3	02160	0	0	067.4	SEARS	1041.3
4057.1	T	1217	FW	B	DV	HL	40	90	3000	0D	GR	3	02220	0	0	058.6	SEARS	1041.4
5057.1	T	1217	FW	B	DV	LH	40	90	3000	0D	GR	3	03543	3	0	059.0	SEARS	1041.5
6057.1	T	1217	FW	B	DV	MH	40	90	3000	0D	GR	3	01855	0	0	070.2	SEARS	1041.6
1053.2	U	1217	FW	B	DV	HH	40	90	3000	0D	GR	3	01984	0	0	068.8	SEARS	1042.1
2053.2	U	1217	FW	B	DV	LL	40	90	3000	0D	GR	3	06016	1	0	048.0	SEARS	1042.2
3053.2	U	1217	FW	B	DV	ML	40	90	3000	0D	GR	3	02552	0	0	067.0	SEARS	1042.3
4053.2	U	1217	FW	B	DV	HL	40	90	3000	0D	GR	3	02396	0	0	058.4	SEARS	1042.4
5053.2	U	1217	FW	B	DV	LH	40	90	3000	0D	GR	3	02164	0	0	069.0	SEARS	1042.5
6053.2	U	1217	FW	B	DV	MH	40	90	3000	0D	GR	3	03964	0	1	059.2	SEARS	1042.6
4060.1	T	1218	FW	B	NF	HH	40	90	3000	0D	GR	3	05145	2	0	049.0	SEARS	1043.1
5060.1	T	1218	FW	B	NF	LL	40	90	3000	0D	GR	3	06880	2	0	040.0	SEARS	1043.2
6060.1	T	1218	FW	B	NF	ML	40	90	3000	0D	GR	3	09951	3	0	024.0	SEARS	1043.3
2060.1	T	1218	FW	B	NF	HL	40	90	3000	0D	GR	3	02155	0	0	[illegible]	SEARS	1043.4
3060.1	T	1218	FW	B	NF	LH	40	90	3000	0D	GR	3	02100	0	0	065.0	SEARS	1043.5
1060.1	T	1218	FW	B	NF	MH	40	90	3000	0D	GR	3	01576	0	1	070.0	SEARS	1043.6
4054.2	U	1217	FW	B	NF	HH	40	90	3000	0D	GR	3	02283	2	0	066.0	RBMANS	1044.1
5054.2	U	1217	FW	B	NF	LL	40	90	3000	0D	GR	3	04068	3	0	058.1	RBMANS	1044.2
6054.2	U	1217	FW	B	NF	ML	40	90	3000	0D	GR	3	02125	0	0	067.6	RBMANS	1044.3
2054.2	U	1217	FW	B	NF	HL	40	90	3000	0D	GR	3	02153	0	0	059.2	RBMANS	1044.4
3054.2	U	1217	FW	B	NF	LH	40	90	3000	0D	GR	3	05381	3	0	050.3	RBMANS	1044.5

1054.2	U	1217	FW	B	NF	MH	40	90	3000	ØD	GR	3	09475	0	3	029.7	RØMANS	1044.6
2061.1	T	1218	FW	B	WF	HH	40	90	3000	ØD	GR	3	01879	0	2	066.9	RØMANS	1045.1
3061.1	T	1218	FW	B	WF	LL	40	90	3000	ØD	GR	3	04720	0	4	052.8	RØMANS	1045.2
1061.1	T	1218	FW	B	WF	ML	40	90	3000	ØD	GR	3	01977	0	0	067.3	RØMANS	1045.3
4061.1	T	1218	FW	B	WF	HL	40	90	3000	ØD	GR	3	04113	0	1	047.3	RØMANS	1045.4
5061.1	T	1218	FW	B	WF	LH	40	90	3000	ØD	GR	3	05568	3	0	047.5	RØMANS	1045.5
6061.1	T	1218	FW	B	WF	MH	40	90	3000	ØD	GR	3	04837	0	3	051.6	RØMANS	1045.6
2055.2	U	1217	FW	B	WF	HH	40	90	3000	ØD	GR	3	03801	2	0	057.5	SEARS	1046.1
3055.2	U	1217	FW	B	WF	LL	40	90	3000	ØD	GR	3	03057	1	0	063.5	SEARS	1046.2
1055.2	U	1217	FW	B	WF	ML	40	90	3000	ØD	GR	3	03821	1	0	057.5	SEARS	1046.3
4055.2	U	1217	FW	B	WF	HL	40	90	3000	ØD	GR	3	03491	1	0	051.8	SEARS	1046.4
5055.2	U	1217	FW	B	WF	LH	40	90	3000	ØD	GR	3	02083	0	0	068.0	SEARS	1046.5
9999.9			FW	B	WF	MH	40	90	3000	ØD	GR	3	00000	0	0	000.0	NØT RUN	1046.6
2013.3	T	1219	FW	B	VF	HH	40	90	3000	ØD	GR	3	01964	0	0	068.0	SEARS	1047.1
3013.3	T	1219	FW	B	VF	LL	40	90	3000	ØD	GR	3	03098	2	0	062.0	SEARS	1047.2
1013.3	T	1219	FW	B	VF	ML	40	90	3000	ØD	GR	3	02909	0	1	064.1	SEARS	1047.3
4013.3	T	1219	FW	B	VF	HL	40	90	3000	ØD	GR	3	02103	0	0	058.8	SEARS	1047.4
5013.3	T	1219	FW	B	VF	LH	40	90	3000	ØD	GR	3	04698	3	0	052.0	SEARS	1047.5
6013.3	T	1219	FW	B	VF	MH	40	90	3000	ØD	GR	3	01876	0	1	069.7	SEARS	1047.6
4063.3	U	1219	FW	B	VF	HH	40	90	3000	ØD	GR	3	01735	0	0	066.4	RØMANS	1048.1
5063.3	U	1219	FW	B	VF	LL	40	90	3000	ØD	GR	3	03021	0	0	060.0	RØMANS	1048.2
6063.3	U	1219	FW	B	VF	ML	40	90	3000	ØD	GR	3	02153	0	0	065.9	RØMANS	1048.3
2063.3	U	1219	FW	B	VF	HL	40	90	3000	ØD	GR	3	02733	3	0	054.2	RØMANS	1048.4
3063.3	U	1219	FW	B	VF	LH	40	90	3000	ØD	GR	3	03821	3	0	055.7	RØMANS	1048.5
1063.3	U	1219	FW	B	VF	MH	40	90	3000	ØD	GR	3	01858	0	0	067.6	RØMANS	1048.6
4056.1	T	1217	FW	B	DV	HH	32	135	3000	ØD	GR	3	00960	0	0	076.4	RØMANS	1049.1
5056.1	T	1217	FW	B	DV	LL	40	135	3000	ØD	GR	3	03214	3	0	061.8	RØMANS	1049.2
6056.1	T	1217	FW	B	DV	ML	40	135	3000	ØD	GR	3	02070	3	0	068.7	RØMANS	1049.3
1056.1	T	1217	FW	B	DV	HL	32	135	3000	ØD	GR	3	00985	0	0	067.4	RØMANS	1049.4
2056.1	T	1217	FW	B	DV	LH	40	135	3000	ØD	GR	3	01075	3	0	057.1	RØMANS	1049.5
3056.1	T	1217	FW	B	DV	MH	40	135	3000	ØD	GR	3	01855	0	0	070.2	RØMANS	1049.6
4047.2	U	1216	FW	B	DV	HH	32	135	3000	ØD	GR	3	01067	0	0	072.0	SEARS	1050.1
5047.2	U	1216	FW	B	DV	LL	40	135	3000	ØD	GR	3	01257	0	0	072.0	SEARS	1050.2
6047.2	U	1216	FW	B	DV	ML	40	135	3000	ØD	GR	3	02014	0	0	066.0	SEARS	1050.3
1047.2	U	1216	FW	B	DV	HL	32	135	3000	ØD	GR	3	01155	0	0	064.0	SEARS	1050.4
2047.2	U	1216	FW	B	DV	LH	40	135	3000	ØD	GR	3	03675	0	1	057.0	SEARS	1050.5
3047.2	U	1216	FW	B	DV	MH	40	135	3000	ØD	GR	3	01944	0	0	068.0	SEARS	1050.6
4058.1	T	1218	FW	B	NF	HH	32	135	3000	ØD	GR	3	04720	0	1	053.0	SEARS	1051.1
5058.1	T	1218	FW	B	NF	LL	40	135	3000	ØD	GR	3	04780	3	0	055.0	SEARS	1051.2
6058.1	T	1218	FW	B	NF	ML	40	135	3000	ØD	GR	3	02254	3	0	068.0	SEARS	1051.3
1058.1	T	1218	FW	B	NF	HL	32	135	3000	ØD	GR	3	01419	0	0	064.0	SEARS	1051.4
2058.1	T	1218	FW	B	NF	LH	40	135	3000	ØD	GR	3	02072	0	1	070.0	SEARS	1051.5
3058.1	T	1218	FW	B	NF	MH	40	135	3000	ØD	GR	3	04583	3	1	056.0	SEARS	1051.6
1048.2	U	1216	FW	B	NF	HH	32	135	3000	ØD	GR	3	01071	0	0	071.0	RØMANS	1052.1
2048.2	U	1216	FW	B	NF	LL	40	135	3000	ØD	GR	3	03671	3	0	058.0	RØMANS	1052.2
3048.2	U	1216	FW	B	NF	ML	40	135	3000	ØD	GR	3	03544	3	0	057.0	RØMANS	1052.3
4048.2	U	1216	FW	B	NF	HL	32	135	3000	ØD	GR	3	01023	0	0	066.0	RØMANS	1052.4
5048.2	U	1216	FW	B	NF	LH	40	135	3000	ØD	GR	3	03088	3	0	060.0	RØMANS	1052.5
6048.2	U	1216	FW	B	NF	MH	40	135	3000	ØD	GR	3	01477	0	0	072.0	RØMANS	1052.6
1059.1	T	1218	FW	B	WF	HH	32	135	3000	ØD	GR	3	00979	0	0	074.0	RØMANS	1053.1
2059.1	T	1218	FW	B	WF	LL	40	135	3000	ØD	GR	3	03043	3	0	063.0	RØMANS	1053.2
3059.1	T	1218	FW	B	WF	ML	40	135	3000	ØD	GR	3	02255	0	0	067.0	RØMANS	1053.3
4059.1	T	1218	FW	B	WF	HL	32	135	3000	ØD	GR	3	01500	0	2	061.0	RØMANS	1053.4

5059.1	T	1218	FW	B	WF	LH	40	135	3000	ØD	GR	3	03825	3	0	057.0	RØMANS	1053.5
6059.1	T	1218	FW	B	WF	MH	40	135	3000	ØD	GR	3	02400	3	0	066.0	RØMANS	1053.6
4049.2	U	1216	FW	B	WF	HH	40	135	3000	ØD	GR	3	04720	0	2	051.0	SEARS	1054.1
5049.2	U	1216	FW	B	WF	LL	40	135	3000	ØD	GR	3	01204	0	0	072.0	SEARS	1054.2
6049.2	U	1216	FW	B	WF	ML	40	135	3000	ØD	GR	3	02999	0	2	063.0	SEARS	1054.3
1049.2	U	1216	FW	B	WF	HL	40	135	3000	ØD	GR	3	02105	0	1	058.0	SEARS	1054.4
2049.2	U	1216	FW	B	WF	LH	40	135	3000	ØD	GR	3	06074	3	0	046.0	SEARS	1054.5
3049.2	U	1216	FW	B	WF	MH	40	135	3000	ØD	GR	3	01829	0	0	069.0	SEARS	1054.6
1044.1	T	1216	FW	B	VF	HH	32	135	3000	ØD	GR	3	01008	0	0	074.0	RØMANS	1055.1
2044.1	T	1216	FW	B	VF	LL	40	135	3000	ØD	GR	3	01567	0	0	069.0	RØMANS	1055.2
3044.1	T	1216	FW	B	VF	ML	40	135	3000	ØD	GR	3	02160	3	0	066.0	RØMANS	1055.3
4044.1	T	1216	FW	B	VF	HL	32	135	3000	ØD	GR	3	01712	0	0	060.0	RØMANS	1055.4
5044.1	T	1216	FW	B	VF	LH	40	135	3000	ØD	GR	3	03894	3	0	057.0	RØMANS	1055.5
6044.1	T	1216	FW	B	VF	MH	40	135	3000	ØD	GR	3	04490	0	2	053.0	RØMANS	1055.6
1050.2	U	1216	FW	B	VF	HH	32	135	3000	ØD	GR	3	00964	0	0	076.0	RØMANS	1056.1
2050.2	U	1216	FW	B	VF	LL	40	135	3000	ØD	GR	3	04649	3	0	054.0	RØMANS	1056.2
3050.2	U	1216	FW	B	VF	ML	40	135	3000	ØD	GR	3	02174	0	0	068.0	RØMANS	1056.3
4050.2	U	1216	FW	B	VF	HL	32	135	3000	ØD	GR	3	00985	0	0	067.0	RØMANS	1056.4
5050.2	U	1216	FW	B	VF	LH	40	135	3000	ØD	GR	3	01018	0	0	076.0	RØMANS	1056.5
6050.2	U	1216	FW	B	VF	MH	40	135	3000	ØD	GR	3	01649	0	0	071.0	RØMANS	1056.6
1040.1	T	1213	FW	B	DV	HH	90	--	3000	ØD	GR	3	00968	0	0	072.0	RØMANS	1057.1
5040.1	T	1213	FW	B	DV	LL	90	--	3000	ØD	GR	3	02645	3	0	060.0	RØMANS	1057.2
6040.1	T	1213	FW	B	DV	ML	90	--	3000	ØD	GR	3	02689	3	0	060.0	RØMANS	1057.3
2040.1	T	1213	FW	B	DV	HL	90	--	3000	ØD	GR	3	02136	0	1	054.0	RØMANS	1057.4
3040.1	T	1213	FW	B	DV	LH	90	--	3000	ØD	GR	3	02951	3	0	058.0	RØMANS	1057.5
4040.1	T	1213	FW	B	DV	MH	90	--	3000	ØD	GR	3	01528	0	0	067.0	RØMANS	1057.6
1046.2	U	1216	FW	B	DV	HH	90	--	3000	ØD	GR	3	01135	0	0	071.0	SEARS	1058.1
2046.2	U	1216	FW	B	DV	LL	90	--	3000	ØD	GR	3	01541	0	0	070.0	SEARS	1058.2
3046.2	U	1216	FW	B	DV	ML	90	--	3000	ØD	GR	3	02671	0	0	064.0	SEARS	1058.3
4046.2	U	1216	FW	B	DV	HL	90	--	3000	ØD	GR	3	01695	0	0	060.0	SEARS	1058.4
5046.2	U	1216	FW	B	DV	LH	90	--	3000	ØD	GR	3	03645	3	0	057.0	SEARS	1058.5
6046.2	U	1216	FW	B	DV	MH	90	--	3000	ØD	GR	3	02190	0	0	065.0	SEARS	1058.6
1041.1	T	1213	FW	B	NF	HH	90	--	3000	ØD	GR	3	01096	0	0	068.0	SEARS	1059.1
5041.1	T	1213	FW	B	NF	LL	90	--	3000	ØD	GR	3	02210	3	0	057.0	SEARS	1059.2
6041.1	T	1213	FW	B	NF	ML	90	--	3000	ØD	GR	3	06525	3	0	041.0	SEARS	1059.3
2041.1	T	1213	FW	B	NF	HL	90	--	3000	ØD	GR	3	01038	0	1	062.0	SEARS	1059.4
3041.1	T	1213	FW	B	NF	LH	90	--	3000	ØD	GR	3	02640	3	2	059.0	SEARS	1059.5
4041.1	T	1213	FW	B	NF	MH	90	--	3000	ØD	GR	3	04517	3	1	048.0	SEARS	1059.6
1051.2	U	1216	FW	B	NF	HH	90	--	3000	ØD	GR	3	06149	1	0	043.0	SEARS	1060.1
2051.2	U	1216	FW	B	NF	LL	90	--	3000	ØD	GR	3	01283	0	0	068.0	SEARS	1060.2
3051.2	U	1216	FW	B	NF	ML	90	--	3000	ØD	GR	3	05090	3	0	048.0	SEARS	1060.3
4051.2	U	1216	FW	B	NF	HL	90	--	3000	ØD	GR	3	04274	0	2	045.0	SEARS	1060.4
5051.2	U	1216	FW	B	NF	LH	90	--	3000	ØD	GR	3	00994	0	0	072.0	SEARS	1060.5
6051.2	U	1216	FW	B	NF	MH	90	--	3000	ØD	GR	3	02774	0	1	061.0	SEARS	1060.6
1042.1	T	1213	FW	B	WF	HH	90	--	3000	ØD	GR	3	00966	0	0	071.0	RØMANS	1061.1
2042.1	T	1213	FW	B	WF	LL	90	--	3000	ØD	GR	3	02243	3	0	062.0	RØMANS	1061.2
3042.1	T	1213	FW	B	WF	ML	90	--	3000	ØD	GR	3	01662	0	0	065.0	RØMANS	1061.3
4042.1	T	1213	FW	B	WF	ML	90	--	3000	ØD	GR	3	01419	0	0	058.0	RØMANS	1061.4
5042.1	T	1213	FW	B	WF	LH	90	--	3000	ØD	GR	3	01816	3	0	054.0	RØMANS	1061.5
6042.1	T	1213	FW	B	WF	MH	90	--	3000	ØD	GR	3	01287	0	0	067.0	RØMANS	1061.6
1052.2	U	1216	FW	B	WF	HH	90	--	3000	ØD	GR	3	00974	0	0	072.0	RØMANS	1062.1
2052.2	U	1216	FW	B	WF	LL	90	--	3000	ØD	GR	3	02699	3	0	062.0	RØMANS	1062.2
3052.2	U	1216	FW	B	WF	ML	90	--	3000	ØD	GR	3	01950	0	0	065.0	RØMANS	1062.3

4052.2	U	1216	FW	B	WF	HL	90	--	3000	ØD	GR	3	00974	0	0	065.0	RØMANS		1062.4
5052.2	U	1216	FW	B	WF	LH	90	--	3000	ØD	GR	3	03224	3	0	059.0	RØMANS		1062.5
6052.2	U	1216	FW	B	WF	MH	90	--	3000	ØD	GR	3	01424	0	0	068.0	RØMANS		1062.6
1045.1	T	1216	FW	B	VF	HH	90	--	3000	ØD	GR	3	05366	0	3	048.0	RØMANS		1063.1
2045.1	T	1216	FW	B	VF	LL	90	--	3000	ØD	GR	3	03277	0	1	057.0	RØMANS		1063.2
3045.1	T	1216	FW	B	VF	ML	90	--	3000	ØD	GR	3	04795	0	1	052.0	RØMANS		1063.3
4045.1	T	1216	FW	B	VF	HL	90	--	3000	ØD	GR	3	05643	0	1	039.0	RØMANS		1063.4
5045.1	T	1216	FW	B	VF	LH	90	--	3000	ØD	GR	3	04187	2	0	055.0	RØMANS		1063.5
6045.1	T	1216	FW	B	VF	MH	90	--	3000	ØD	GR	3	07045	0	3	041.0	RØMANS		1063.6
1064.3	U	1219	FW	B	VF	HH	90	--	3000	ØD	GR	3	07359	1	0	038.2	SEARS		1064.1
2064.3	U	1219	FW	B	VF	LL	90	--	3000	ØD	GR	3	04985	0	1	053.0	SEARS		1064.2
3064.3	U	1219	FW	B	VF	ML	90	--	3000	ØD	GR	3	07357	0	2	040.0	SEARS		1064.3
4064.3	U	1219	FW	B	VF	HL	90	--	3000	ØD	GR	3	03532	0	1	050.2	SEARS		1064.4
5064.3	U	1219	FW	B	VF	LH	90	--	3000	ØD	GR	3	06187	3	0	044.8	SEARS		1064.5
6064.3	U	1219	FW	B	VF	MH	90	--	3000	ØD	GR	3	08259	3	0	034.7	SEARS		1064.6
1074.4	T	0106	FW	C	DV	MH	40	180	3000	ØD	GR	3	01020	0	0	064.4	SEARS	1	1065.1
2074.4	T	0106	FW	C	DV	HH	40	180	3000	ØD	GR	3	01264	0	0	060.7	SEARS	1	1065.2
3074.4	T	0106	FW	C	DV	LL	40	180	3000	ØD	GR	3	04420	1	0	043.9	SEARS	1	1065.3
4074.4	T	0106	FW	C	DV	ML	40	180	3000	ØD	GR	3	01050	0	0	062.9	SEARS	1	1065.4
5074.4	T	0106	FW	C	DV	HL	40	180	3000	ØD	GR	3	04040	3	0	047.8	SEARS	1	1065.5
6074.4	T	0106	FW	C	DV	LH	40	180	3000	ØD	GR	3	03681	3	0	048.2	SEARS	1	1065.6
1066.4	U	0106	FW	C	DV	MH	40	180	3000	ØD	GR	3	06996	0	1	030.3	RØMANS	1	1066.1
2066.4	U	0106	FW	C	DV	HH	40	180	3000	ØD	GR	3	01675	0	0	058.0	RØMANS	1	1066.2
3066.4	U	0106	FW	C	DV	LL	40	180	3000	ØD	GR	3	01920	0	0	058.2	RØMANS	1	1066.3
4066.4	U	0106	FW	C	DV	ML	40	180	3000	ØD	GR	3	10000	0	1	064.0	RØMANS	1	1066.4
5066.4	U	0106	FW	C	DV	HL	40	180	3000	ØD	GR	3	04129	0	1	045.4	RØMANS	1	1066.5
6066.4	U	0106	FW	C	DV	LH	40	180	3000	ØD	GR	3	01548	0	0	061.5	RØMANS	1	1066.6
1075.4	T	0106	FW	C	NF	MH	40	180	3000	ØD	GR	3	01005	0	0	063.7	SEARS	2	1067.1
2075.4	T	0106	FW	C	NF	HH	40	180	3000	ØD	GR	3	01330	0	0	060.3	SEARS	3	1067.2
3075.4	T	0106	FW	C	NF	LL	40	180	3000	ØD	GR	3	02059	0	0	056.7	SEARS	2	1067.3
4075.4	T	0106	FW	C	NF	ML	40	180	3000	ØD	GR	3	02120	1	0	055.7	SEARS	2	1067.4
5075.4	T	0106	FW	C	NF	HL	40	180	3000	ØD	GR	3	01973	0	0	064.0	SEARS	2	1067.5
6075.4	T	0106	FW	C	NF	LH	40	180	3000	ØD	GR	3	01658	0	0	060.0	SEARS	2	1067.6
1067.4	U	0106	FW	C	NF	MH	40	180	3000	ØD	GR	3	05817	0	1	037.1	RØMANS	1	1068.1
2067.4	U	0106	FW	C	NF	HH	40	180	3000	ØD	GR	3	01895	0	0	057.8	RØMANS	5	1068.2
3067.4	U	0106	FW	C	NF	LL	40	180	3000	ØD	GR	3	07861	0	1	026.3	RØMANS	1	1068.3
4067.4	U	0106	FW	C	NF	ML	40	180	3000	ØD	GR	3	06462	0	1	033.0	RØMANS	1	1068.4
5067.4	U	0106	FW	C	NF	HL	40	180	3000	ØD	GR	3	05599	0	1	037.9	RØMANS	1	1068.5
6067.4	U	0106	FW	C	NF	LH	40	180	3000	ØD	GR	3	06300	0	3	034.5	RØMANS	1	1068.6
1076.4	T	0106	FW	C	WF	MH	40	180	3000	ØD	GR	3	01060	0	0	063.1	SEARS	2	1069.1
2076.4	T	0106	FW	C	WF	HH	40	180	3000	ØD	GR	3	02143	1	0	055.1	SEARS	2	1069.2
3076.4	T	0106	FW	C	WF	LL	40	180	3000	ØD	GR	3	02127	2	0	056.5	SEARS	2	1069.3
4076.4	T	0106	FW	C	WF	ML	40	180	3000	ØD	GR	3	01308	0	0	060.8	SEARS	2	1069.4
5076.4	T	0106	FW	C	WF	HL	40	180	3000	ØD	GR	3	02028	0	0	068.9	SEARS	2	1069.5
6076.4	T	0106	FW	C	WF	LH	40	180	3000	ØD	GR	3	03105	3	0	051.0	SEARS	2	1069.6
1068.4	U	0106	FW	C	WF	MH	40	180	3000	ØD	GR	3	01517	0	1	060.6	RØMANS	1	1070.1
2068.4	U	0106	FW	C	WF	HH	40	180	3000	ØD	GR	3	01836	0	0	059.5	RØMANS	4	1070.2
3068.4	U	0106	FW	C	WF	LL	40	180	3000	ØD	GR	3	03435	0	2	050.6	RØMANS	1	1070.3
4068.4	U	0106	FW	C	WF	ML	40	180	3000	ØD	GR	3	01000	0	0	066.9	RØMANS	1	1070.4
5068.4	U	0106	FW	C	WF	HL	40	180	3000	ØD	GR	3	00960	0	0	065.0	RØMANS	1	1070.5
6068.4	U	0106	FW	C	WF	LH	40	180	3000	ØD	GR	3	04497	3	0	043.9	RØMANS	4	1070.6
1077.3	T	0106	FW	C	VF	MH	40	180	3000	ØD	GR	3	01020	0	0	063.2	SEARS	2	1071.1
2077.3	T	0106	FW	C	VF	HH	40	180	3000	ØD	GR	3	02195	1	0	058.9	SEARS	2	1071.2

3077.3	T	0106	FW	C	VF	LL	40	180	3000	ØD	GR	3	02160	0	0	056.5	SEARS	2	1071.3
4077.3	T	0106	FW	C	VF	ML	40	180	3000	ØD	GR	3	05452	1	0	038.2	SEARS	2	1071.4
5077.3	T	0106	FW	C	VF	HL	40	180	3000	ØD	GR	3	02452	3	0	054.4	SEARS	2	1071.5
6077.3	T	0106	FW	C	VF	LH	40	180	3000	ØD	GR	3	02175	3	0	056.3	SEARS	2	1071.6
1069.3	U	0106	FW	C	VF	MH	40	180	3000	ØD	GR	3	01038	0	0	064.2	RØMANS	1	1072.1
2069.3	U	0106	FW	C	VF	HH	40	180	3000	ØD	GR	3	01712	0	0	058.9	RØMANS	1	1072.2
3069.3	U	0106	FW	C	VF	LL	40	180	3000	ØD	GR	3	02142	0	0	057.5	RØMANS	4	1072.3
4069.3	U	0106	FW	C	VF	ML	40	180	3000	ØD	GR	3	02130	0	1	055.5	RØMANS	1	1072.4
5069.3	U	0106	FW	C	VF	HL	40	180	3000	ØD	GR	3	00960	0	0	065.5	RØMANS	1	1072.5
6069.3	U	0106	FW	C	VF	LH	40	180	3000	ØD	GR	3	01822	0	0	058.1	RØMANS	4	1072.6
1083.4	T	0107	FW	C	DV	MH	40	90	3000	ØD	GR	3	07710	0	1	026.5	SEARS	1	1073.1
2083.4	T	0107	FW	C	DV	HH	40	90	3000	ØD	GR	3	05230	1	1	038.2	SEARS	1	1073.2
3083.4	T	0107	FW	C	DV	LL	40	90	3000	ØD	GR	3	05101	2	0	041.3	SEARS	1	1073.3
4083.4	T	0107	FW	C	DV	ML	40	90	3000	ØD	GR	3	06322	2	0	034.8	SEARS	1	1073.4
5083.4	T	0107	FW	C	DV	HL	40	90	3000	ØD	GR	3	02857	1	0	051.5	SEARS	1	1073.5
6083.4	T	0107	FW	C	DV	LH	40	90	3000	ØD	GR	3	06145	0	3	036.0	SEARS	1	1073.6
1087.3	U	0107	FW	C	DV	MH	40	90	3000	ØD	GR	3	01787	0	0	057.5	RØMANS	1	1074.1
2087.3	U	0107	FW	C	DV	HH	40	90	3000	ØD	GR	3	02825	0	0	053.3	RØMANS	1	1074.2
3087.3	U	0107	FW	C	DV	LL	40	90	3000	ØD	GR	3	04035	3	0	047.0	RØMANS	1	1074.3
4087.3	U	0107	FW	C	DV	ML	40	90	3000	ØD	GR	3	02734	0	1	052.7	RØMANS	1	1074.4
5087.3	U	0107	FW	C	DV	HL	40	90	3000	ØD	GR	3	02208	0	2	055.3	RØMANS	1	1074.5
6087.3	U	0107	FW	C	DV	LH	40	90	3000	ØD	GR	3	05355	3	0	039.8	RØMANS	1	1074.6
1091.4	T	0107	FW	C	NF	MH	40	90	3000	ØD	GR	3	03570	0	2	047.6	SEARS	2	1075.1
2091.4	T	0107	FW	C	NF	HH	40	90	3000	ØD	GR	3	02868	0	0	054.5	SEARS	2	1075.2
3091.4	T	0107	FW	C	NF	LL	40	90	3000	ØD	GR	3	06465	0	2	034.1	SEARS	2	1075.3
4091.4	T	0107	FW	C	NF	ML	40	90	3000	ØD	GR	3	03484	3	0	048.3	SEARS	2	1075.4
5091.4	T	0107	FW	C	NF	HL	40	90	3000	ØD	GR	3	01960	0	0	056.9	SEARS	2	1075.5
6091.4	T	0107	FW	C	NF	LH	40	90	3000	ØD	GR	3	07680	3	0	027.2	SEARS	2	1075.6
1088.3	U	0107	FW	C	NF	MH	40	90	3000	ØD	GR	3	05760	0	1	036.9	RØMANS	1	1076.1
2088.3	U	0107	FW	C	NF	HH	40	90	3000	ØD	GR	3	02910	0	0	052.8	RØMANS	1	1076.2
3088.3	U	0107	FW	C	NF	LL	40	90	3000	ØD	GR	3	02010	0	0	057.2	RØMANS	1	1076.3
4088.3	U	0107	FW	C	NF	ML	40	90	3000	ØD	GR	3	02131	0	0	058.2	RØMANS	1	1076.4
5088.3	U	0107	FW	C	NF	HL	40	90	3000	ØD	GR	3	02362	0	1	054.4	RØMANS	1	1076.5
6088.3	U	0107	FW	C	NF	LH	40	90	3000	ØD	GR	3	01576	0	0	059.7	RØMANS	1	1076.6
1092.4	T	0107	FW	C	WF	MH	40	90	3000	ØD	GR	3	01900	0	0	056.8	SEARS	1	1077.1
2092.4	T	0107	FW	C	WF	HH	40	90	3000	ØD	GR	3	02821	0	0	051.2	SEARS	1	1077.2
3092.4	T	0107	FW	C	WF	LL	40	90	3000	ØD	GR	3	02140	0	0	057.0	SEARS	1	1077.3
4092.4	T	0107	FW	C	WF	ML	40	90	3000	ØD	GR	3	02040	0	0	056.0	SEARS	2	1077.4
5092.4	T	0107	FW	C	WF	HL	40	90	3000	ØD	GR	3	01975	0	0	058.0	SEARS	2	1077.5
6092.4	T	0107	FW	C	WF	LH	40	90	3000	ØD	GR	3	03645	3	0	048.1	SEARS	2	1077.6
1089.3	U	0107	FW	C	WF	MH	40	90	3000	ØD	GR	3	04002	0	1	045.8	RØMANS	4	1078.1
2089.3	U	0107	FW	C	WF	HH	40	90	3000	ØD	GR	3	02945	0	0	051.9	RØMANS	4	1078.2
3089.3	U	0107	FW	C	WF	LL	40	90	3000	ØD	GR	3	02025	0	0	056.8	RØMANS	1	1078.3
4089.3	U	0107	FW	C	WF	ML	40	90	3000	ØD	GR	3	02092	0	0	057.2	RØMANS	4	1078.4
5089.3	U	0107	FW	C	WF	HL	40	90	3000	ØD	GR	3	02200	0	0	057.2	RØMANS	4	1078.5
6089.3	U	0107	FW	C	WF	LH	40	90	3000	ØD	GR	3	04575	3	0	043.4	RØMANS	4	1078.6
1093.3	T	0107	FW	C	VF	MH	40	90	3000	ØD	GR	3	10243	0	1	013.9	SEARS	4	1079.1
2093.3	T	0107	FW	C	VF	HH	40	90	3000	ØD	GR	3	08494	0	0	022.9	SEARS	4	1079.2
3093.3	T	0107	FW	C	VF	LL	40	90	3000	ØD	GR	3	02955	3	0	052.4	SEARS	4	1079.3
4093.3	T	0107	FW	C	VF	ML	40	90	3000	ØD	GR	3	02760	3	0	052.0	SEARS	4	1079.4
5093.3	T	0107	FW	C	VF	HL	40	90	3000	ØD	GR	3	01975	3	0	057.5	SEARS	4	1079.5
6093.3	T	0107	FW	C	VF	LH	40	90	3000	ØD	GR	3	05569	3	0	038.6	SEARS	4	1079.6
1090.3	U	0107	FW	C	VF	MH	40	90	3000	ØD	GR	3	04748	0	2	041.8	RØMANS	4	1080.1

2090.3	U	0107	FW	C	VF	HH	40	90	3000	ØD	GR	3	02880	0	0	051.9	RØMANS	4	1080.2
3090.3	U	0107	FW	C	VF	LL	40	90	3000	ØD	GR	3	04875	0	1	041.7	RØMANS	4	1080.3
4090.3	U	0107	FW	C	VF	ML	40	90	3000	ØD	GR	3	05745	0	2	036.6	RØMANS	4	1080.4
5090.3	U	0107	FW	C	VF	HL	40	90	3000	ØD	GR	3	03961	3	0	045.6	RØMANS	4	1080.5
6090.3	U	0107	FW	C	VF	LH	40	90	3000	ØD	GR	3	06285	3	0	034.9	RØMANS	4	1080.6
1073.4	T	0106	FW	C	DV	MH	32	135	3000	ØD	GR	3	05040	0	1	040.1	RØMANS	1	1081.1
2073.4	T	0106	FW	C	DV	HH	40	135	3000	ØD	GR	3	05425	0	1	037.5	RØMANS	1	1081.2
3073.4	T	0106	FW	C	DV	LL	40	135	3000	ØD	GR	3	03652	0	2	048.0	RØMANS	1	1081.3
4073.4	T	0106	FW	C	DV	ML	32	135	3000	ØD	GR	3	01020	0	0	067.4	RØMANS	1	1081.4
5073.4	T	0106	FW	C	DV	HL	40	135	3000	ØD	GR	3	00960	0	0	066.1	RØMANS	1	1081.5
6073.4	T	0106	FW	C	DV	LH	40	135	3000	ØD	GR	3	02031	0	2	057.5	RØMANS	1	1081.6
1070.3	U	0106	FW	C	DV	MH	32	135	3000	ØD	GR	3	06376	0	1	033.2	RØMANS	1	1082.1
2070.3	U	0106	FW	C	DV	HH	40	135	3000	ØD	GR	3	10188	0	2	013.3	RØMANS	1	1082.2
3070.3	U	0106	FW	C	DV	LL	40	135	3000	ØD	GR	3	07117	0	2	030.2	RØMANS	1	1082.3
4070.3	U	0106	FW	C	DV	ML	32	135	3000	ØD	GR	3	01542	0	1	058.3	RØMANS	1	1082.4
5070.3	U	0106	FW	C	DV	HL	40	135	3000	ØD	GR	3	07099	0	3	029.7	RØMANS	1	1082.5
6070.3	U	0106	FW	C	DV	LH	40	135	3000	ØD	GR	3	01545	0	0	060.2	RØMANS	1	1082.6
1084.3	T	0107	FW	C	NF	MH	32	135	3000	ØD	GR	3	01000	0	0	063.9	RØMANS	1	1083.1
2084.3	T	0107	FW	C	NF	HH	40	135	3000	ØD	GR	3	01692	0	0	057.7	RØMANS	1	1083.2
3084.3	T	0107	FW	C	NF	LL	40	135	3000	ØD	GR	3	02160	0	0	056.7	RØMANS	1	1083.3
4084.3	T	0107	FW	C	NF	ML	32	135	3000	ØD	GR	3	02598	0	1	052.4	RØMANS	1	1083.4
5084.3	T	0107	FW	C	NF	HL	40	135	3000	ØD	GR	3	00975	0	0	064.2	RØMANS	1	1083.5
6084.3	T	0107	FW	C	NF	LH	40	135	3000	ØD	GR	3	03060	3	0	050.6	RØMANS	1	1083.6
1071.3	U	0106	FW	C	NF	MH	32	135	3000	ØD	GR	3	07204	0	4	029.1	RØMANS	1	1084.1
2071.3	U	0106	FW	C	NF	HH	40	135	3000	ØD	GR	3	01410	0	0	059.3	RØMANS	1	1084.2
3071.3	U	0106	FW	C	NF	LL	40	135	3000	ØD	GR	3	01986	0	0	058.0	RØMANS	1	1084.3
4071.3	U	0106	FW	C	NF	ML	32	135	3000	ØD	GR	3	04756	0	2	042.0	RØMANS	4	1084.4
5071.3	U	0106	FW	C	NF	HL	40	135	3000	ØD	GR	3	00960	0	0	066.4	RØMANS	1	1084.5
6071.3	U	0106	FW	C	NF	LH	40	135	3000	ØD	GR	3	02883	3	0	052.7	RØMANS	1	1084.6
1085.4	T	0107	FW	C	WF	MH	32	135	3000	ØD	GR	3	00960	0	0	064.5	RØMANS	1	1085.1
2085.4	T	0107	FW	C	WF	HH	40	135	3000	ØD	GR	3	01680	0	0	057.6	RØMANS	4	1085.2
3085.4	T	0107	FW	C	WF	LL	40	135	3000	ØD	GR	3	02627	3	0	053.3	RØMANS	1	1085.3
4085.4	T	0107	FW	C	WF	ML	32	135	3000	ØD	GR	3	00965	0	0	068.9	RØMANS	1	1085.4
5085.4	T	0107	FW	C	WF	HL	40	135	3000	ØD	GR	3	02535	3	0	054.7	RØMANS	1	1085.5
6085.4	T	0107	FW	C	WF	LH	40	135	3000	ØD	GR	3	01719	0	0	059.9	RØMANS	1	1085.6
1072.3	U	0106	FW	C	WF	MH	32	135	3000	ØD	GR	3	06561	0	1	032.2	RØMANS	1	1086.1
2072.3	U	0106	FW	C	WF	HH	40	135	3000	ØD	GR	3	01651	0	0	057.8	RØMANS	4	1086.2
3072.3	U	0106	FW	C	WF	LL	40	135	3000	ØD	GR	3	01933	0	0	057.3	RØMANS	4	1086.3
4072.3	U	0106	FW	C	WF	ML	32	135	3000	ØD	GR	3	01473	0	1	059.2	RØMANS	1	1086.4
5072.3	U	0106	FW	C	WF	HL	40	135	3000	ØD	GR	3	02875	0	1	051.7	RØMANS	1	1086.5
6072.3	U	0106	FW	C	WF	LH	40	135	3000	ØD	GR	3	03405	3	0	049.4	RØMANS	1	1086.6
1086.3	T	0107	FW	C	VF	MH	32	135	3000	ØD	GR	3	00960	0	0	064.7	RØMANS	4	1087.1
2086.3	T	0107	FW	C	VF	HH	40	135	3000	ØD	GR	3	07995	0	1	024.2	RØMANS	4	1087.2
3086.3	T	0107	FW	C	VF	LL	40	135	3000	ØD	GR	3	02152	0	0	056.1	RØMANS	4	1087.3
4086.3	T	0107	FW	C	VF	ML	32	135	3000	ØD	GR	3	00965	0	0	066.3	RØMANS	4	1087.4
5086.3	T	0107	FW	C	VF	HL	40	135	3000	ØD	GR	3	00965	0	0	067.0	RØMANS	4	1087.5
6086.3	T	0107	FW	C	VF	LH	40	135	3000	ØD	GR	3	01650	0	0	060.8	RØMANS	4	1087.6
1097.3	U	0107	FW	C	VF	MH	32	135	3000	ØD	GR	3	01030	0	0	064.2	RØMANS	4	1088.1
2097.3	U	0107	FW	C	VF	HH	40	135	3000	ØD	GR	3	01576	0	0	058.3	RØMANS	1	1088.2
3097.3	U	0107	FW	C	VF	LL	40	135	3000	ØD	GR	3	02126	0	0	056.3	RØMANS	4	1088.3
4097.3	U	0107	FW	C	VF	ML	32	135	3000	ØD	GR	3	00965	0	0	064.6	RØMANS	1	1088.4
5097.3	U	0107	FW	C	VF	HL	40	135	3000	ØD	GR	3	00960	0	0	064.3	RØMANS	1	1088.5
6097.3	U	0107	FW	C	VF	LH	40	135	3000	ØD	GR	3	01620	0	0	060.9	RØMANS	D	1088.6

2090.3	U	0107	FW	C	VF	HH	40	90	3000	ØD	GR	3	02880	0	0	051.9	RØMANS	4	1080.2
3090.3	U	0107	FW	C	VF	LL	40	90	3000	ØD	GR	3	04875	0	1	041.7	RØMANS	4	1080.3
4090.3	U	0107	FW	C	VF	ML	40	90	3000	ØD	GR	3	05745	0	2	036.6	RØMANS	4	1080.4
5090.3	U	0107	FW	C	VF	HL	40	90	3000	ØD	GR	3	03961	3	0	045.6	RØMANS	4	1080.5
6090.3	U	0107	FW	C	VF	LH	40	90	3000	ØD	GR	3	06285	3	0	034.9	RØMANS	4	1080.6
1073.4	T	0106	FW	C	DV	MH	32	135	3000	ØD	GR	3	05040	0	1	040.1	RØMANS	1	1081.1
2073.4	T	0106	FW	C	DV	HH	40	135	3000	ØD	GR	3	05425	0	1	037.5	RØMANS	1	1081.2
3073.4	T	0106	FW	C	DV	LL	40	135	3000	ØD	GR	3	03652	0	2	048.0	RØMANS	1	1081.3
4073.4	T	0106	FW	C	DV	ML	32	135	3000	ØD	GR	3	01020	0	0	067.4	RØMANS	1	1081.4
5073.4	T	0106	FW	C	DV	HL	40	135	3000	ØD	GR	3	00960	0	0	066.1	RØMANS	1	1081.5
6073.4	T	0106	FW	C	DV	LH	40	135	3000	ØD	GR	3	02031	0	2	057.5	RØMANS	1	1081.6
1070.3	U	0106	FW	C	DV	MH	32	135	3000	ØD	GR	3	06376	0	1	033.2	RØMANS	1	1082.1
2070.3	U	0106	FW	C	DV	HH	40	135	3000	ØD	GR	3	10188	0	2	013.3	RØMANS	1	1082.2
3070.3	U	0106	FW	C	DV	LL	40	135	3000	ØD	GR	3	07117	0	2	030.2	RØMANS	1	1082.3
4070.3	U	0106	FW	C	DV	ML	32	135	3000	ØD	GR	3	01542	0	1	058.3	RØMANS	1	1082.4
5070.3	U	0106	FW	C	DV	HL	40	135	3000	ØD	GR	3	07099	0	3	029.7	RØMANS	1	1082.5
6070.3	U	0106	FW	C	DV	LH	40	135	3000	ØD	GR	3	01545	0	0	060.2	RØMANS	1	1082.6
1084.3	T	0107	FW	C	NF	MH	32	135	3000	ØD	GR	3	01000	0	0	063.9	RØMANS	1	1083.1
2084.3	T	0107	FW	C	NF	HH	40	135	3000	ØD	GR	3	01692	0	0	057.7	RØMANS	1	1083.2
3084.3	T	0107	FW	C	NF	LL	40	135	3000	ØD	GR	3	02160	0	0	056.7	RØMANS	1	1083.3
4084.3	T	0107	FW	C	NF	ML	32	135	3000	ØD	GR	3	02598	0	1	052.4	RØMANS	1	1083.4
5084.3	T	0107	FW	C	NF	HL	40	135	3000	ØD	GR	3	00975	0	0	064.2	RØMANS	1	1083.5
6084.3	T	0107	FW	C	NF	LH	40	135	3000	ØD	GR	3	03060	3	0	050.6	RØMANS	1	1083.6
1071.3	U	0106	FW	C	NF	MH	32	135	3000	ØD	GR	3	07204	0	4	029.1	RØMANS	1	1084.1
2071.3	U	0106	FW	C	NF	HH	40	135	3000	ØD	GR	3	01410	0	0	059.3	RØMANS	1	1084.2
3071.3	U	0106	FW	C	NF	LL	40	135	3000	ØD	GR	3	01986	0	0	058.0	RØMANS	1	1084.3
4071.3	U	0106	FW	C	NF	ML	32	135	3000	ØD	GR	3	04756	0	2	042.0	RØMANS	4	1084.4
5071.3	U	0106	FW	C	NF	HL	40	135	3000	ØD	GR	3	00960	0	0	066.4	RØMANS	1	1084.5
6071.3	U	0106	FW	C	NF	LH	40	135	3000	ØD	GR	3	02883	3	0	052.7	RØMANS	1	1084.6
1085.4	T	0107	FW	C	WF	MH	32	135	3000	ØD	GR	3	00960	0	0	064.5	RØMANS	1	1085.1
2085.4	T	0107	FW	C	WF	HH	40	135	3000	ØD	GR	3	01680	0	0	057.6	RØMANS	4	1085.2
3085.4	T	0107	FW	C	WF	LL	40	135	3000	ØD	GR	3	02627	3	0	053.3	RØMANS	1	1085.3
4085.4	T	0107	FW	C	WF	ML	32	135	3000	ØD	GR	3	00965	0	0	068.9	RØMANS	1	1085.4
5085.4	T	0107	FW	C	WF	HL	40	135	3000	ØD	GR	3	02535	3	0	054.7	RØMANS	1	1085.5
6085.4	T	0107	FW	C	WF	LH	40	135	3000	ØD	GR	3	01719	0	0	059.9	RØMANS	1	1085.6
1072.3	U	0106	FW	C	WF	MH	32	135	3000	ØD	GR	3	06561	0	1	032.2	RØMANS	1	1086.1
2072.3	U	0106	FW	C	WF	HH	40	135	3000	ØD	GR	3	01651	0	0	057.8	RØMANS	4	1086.2
3072.3	U	0106	FW	C	WF	LL	40	135	3000	ØD	GR	3	01933	0	0	057.3	RØMANS	4	1086.3
4072.3	U	0106	FW	C	WF	ML	32	135	3000	ØD	GR	3	01473	0	1	059.2	RØMANS	1	1086.4
5072.3	U	0106	FW	C	WF	HL	40	135	3000	ØD	GR	3	02875	0	1	051.7	RØMANS	1	1086.5
6072.3	U	0106	FW	C	WF	LH	40	135	3000	ØD	GR	3	03405	3	0	049.4	RØMANS	1	1086.6
1086.3	T	0107	FW	C	VF	MH	32	135	3000	ØD	GR	3	00960	0	0	064.7	RØMANS	4	1087.1
2086.3	T	0107	FW	C	VF	HH	40	135	3000	ØD	GR	3	07995	0	1	024.2	RØMANS	4	1087.2
3086.3	T	0107	FW	C	VF	LL	40	135	3000	ØD	GR	3	02152	0	0	056.1	RØMANS	4	1087.3
4086.3	T	0107	FW	C	VF	ML	32	135	3000	ØD	GR	3	00965	0	0	066.3	RØMANS	4	1087.4
5086.3	T	0107	FW	C	VF	HL	40	135	3000	ØD	GR	3	00965	0	0	067.0	RØMANS	4	1087.5
6086.3	T	0107	FW	C	VF	LH	40	135	3000	ØD	GR	3	01650	0	0	060.8	RØMANS	4	1087.6
1097.3	U	0107	FW	C	VF	MH	32	135	3000	ØD	GR	3	01030	0	0	064.2	RØMANS	4	1088.1
2097.3	U	0107	FW	C	VF	HH	40	135	3000	ØD	GR	3	01576	0	0	058.3	RØMANS	1	1088.2
3097.3	U	0107	FW	C	VF	LL	40	135	3000	ØD	GR	3	02126	0	0	056.3	RØMANS	4	1088.3
4097.3	U	0107	FW	C	VF	ML	32	135	3000	ØD	GR	3	00965	0	0	064.6	RØMANS	1	1088.4
5097.3	U	0107	FW	C	VF	HL	40	135	3000	ØD	GR	3	00960	0	0	064.3	RØMANS	1	1088.5
6097.3	U	0107	FW	C	VF	LH	40	135	3000	ØD	GR	3	01620	0	0	060.9	RØMANS	D	1088.6

1078.4	T	0106	FW	C	DV	MH	90	--	3000	ØD	GR	3	02760	1	0	053.0	SEARS	1	1089.1
2078.4	T	0106	FW	C	DV	HH	90	--	3000	ØD	GR	3	01821	0	0	057.6	SEARS	1	1089.2
3078.4	T	0106	FW	C	DV	LL	90	--	3000	ØD	GR	3	01971	0	0	057.5	SEARS	1	1089.3
4078.4	T	0106	FW	C	DV	ML	90	--	3000	ØD	GR	3	02951	3	0	052.3	SEARS	1	1089.4
5078.4	T	0106	FW	C	DV	HL	90	--	3000	ØD	GR	3	03576	3	0	048.7	SEARS	1	1089.5
6078.4	T	0106	FW	C	DV	LH	90	--	3000	ØD	GR	3	05157	3	0	040.5	SEARS	1	1089.6
1082.3	U	0106	FW	C	DV	MH	90	--	3000	ØD	GR	3	01080	0	0	064.6	SEARS	1	1090.1
2082.3	U	0106	FW	C	DV	HH	90	--	3000	ØD	GR	3	01571	0	0	058.8	SEARS	1	1090.2
3082.3	U	0106	FW	C	DV	LL	90	--	3000	ØD	GR	3	02063	0	0	057.0	SEARS	1	1090.3
4082.3	U	0106	FW	C	DV	ML	90	--	3000	ØD	GR	3	03116	3	0	050.7	SEARS	1	1090.4
5082.3	U	0106	FW	C	DV	HL	90	--	3000	ØD	GR	3	01230	0	0	062.4	SEARS	1	1090.5
6082.3	U	0106	FW	C	DV	LH	90	--	3000	ØD	GR	3	05280	3	0	039.7	SEARS	1	1090.6
1079.4	T	0106	FW	C	NF	MH	90	--	3000	ØD	GR	3	01091	0	0	064.1	SEARS	1	1091.1
2079.4	T	0106	FW	C	NF	HH	90	--	3000	ØD	GR	3	01835	0	0	057.6	SEARS	1	1091.2
3079.4	T	0106	FW	C	NF	LL	90	--	3000	ØD	GR	3	01925	0	0	058.2	SEARS	2	1091.3
4079.4	T	0106	FW	C	NF	ML	90	--	3000	ØD	GR	3	00960	0	0	068.6	SEARS	1	1091.4
5079.4	T	0106	FW	C	NF	HL	90	--	3000	ØD	GR	3	01010	0	0	065.1	SEARS	2	1091.5
6079.4	T	0106	FW	C	NF	LH	90	--	3000	ØD	GR	3	02307	3	0	055.9	SEARS	2	1091.6
1094.4	U	0108	FW	C	NF	MH	90	--	3000	ØD	GR	3	03985	0	1	046.9	SEARS	1	1092.1
2094.4	U	0108	FW	C	NF	HH	90	--	3000	ØD	GR	3	03145	0	1	050.8	SEARS	2	1092.2
3094.4	U	0108	FW	C	NF	LL	90	--	3000	ØD	GR	3	04735	3	0	043.1	SEARS	2	1092.3
4094.4	U	0108	FW	C	NF	ML	90	--	3000	ØD	GR	3	05502	2	0	038.9	SEARS	2	1092.4
5094.4	U	0108	FW	C	NF	HL	90	--	3000	ØD	GR	3	03187	3	0	051.4	SEARS	2	1092.5
6094.4	U	0108	FW	C	NF	LH	90	--	3000	ØD	GR	3	04327	3	0	045.2	SEARS	2	1092.6
1080.4	T	0106	FW	C	WF	MH	90	--	3000	ØD	GR	3	00965	0	0	065.9	SEARS	1	1093.1
2080.4	T	0106	FW	C	WF	HH	90	--	3000	ØD	GR	3	01490	0	0	060.1	SEARS	1	1093.2
3080.4	T	0106	FW	C	WF	LL	90	--	3000	ØD	GR	3	02006	0	0	057.9	SEARS	1	1093.3
4080.4	T	0106	FW	C	WF	ML	90	--	3000	ØD	GR	3	04920	3	0	041.5	SEARS	1	1093.4
5080.4	T	0106	FW	C	WF	HL	90	--	3000	ØD	GR	3	07185	3	0	030.0	SEARS	1	1093.5
6080.4	T	0106	FW	C	WF	LH	90	--	3000	ØD	GR	3	05186	1	0	040.3	SEARS	1	1093.6
1095.3	U	0108	FW	C	WF	MH	90	--	3000	ØD	GR	3	10443	3	0	013.2	RØMANS	1	1094.1
2095.3	U	0108	FW	C	WF	HH	90	--	3000	ØD	GR	3	01699	0	0	059.9	RØMANS	4	1094.2
3095.3	U	0108	FW	C	WF	LL	90	--	3000	ØD	GR	3	01987	0	0	058.0	RØMANS	4	1094.3
4095.3	U	0108	FW	C	WF	ML	90	--	3000	ØD	GR	3	08460	0	1	023.3	RØMANS	2	1094.4
5095.3	U	0108	FW	C	WF	HL	90	--	3000	ØD	GR	3	04912	0	3	042.0	RØMANS	4	1094.5
6095.3	U	0108	FW	C	WF	LH	90	--	3000	ØD	GR	3	09105	3	0	020.3	RØMANS	4	1094.6
1081.3	T	0106	FW	C	VF	MH	90	--	3000	ØD	GR	3	01005	0	0	065.5	SEARS	2	1095.1
2081.3	T	0106	FW	C	VF	HH	90	--	3000	ØD	GR	3	01755	0	0	058.7	SEARS	2	1095.2
3081.3	T	0106	FW	C	VF	LL	90	--	3000	ØD	GR	3	01946	0	0	059.0	SEARS	1	1095.3
4081.3	T	0106	FW	C	VF	ML	90	--	3000	ØD	GR	3	00960	0	0	066.3	SEARS	2	1095.4
5081.3	T	0106	FW	C	VF	HL	90	--	3000	ØD	GR	3	00965	3	0	066.2	SEARS	2	1095.5
6081.3	T	0106	FW	C	VF	LH	90	--	3000	ØD	GR	3	02667	3	0	053.9	SEARS	3	1095.6
1096.3	U	0108	FW	C	VF	MH	90	--	3000	ØD	GR	3	01222	0	0	062.8	SEARS	4	1096.1
2096.3	U	0108	FW	C	VF	HH	90	--	3000	ØD	GR	3	01560	0	0	059.5	SEARS	4	1096.2
3096.3	U	0108	FW	C	VF	LL	90	--	3000	ØD	GR	3	02410	3	0	055.0	SEARS	4	1096.3
4096.3	U	0108	FW	C	VF	ML	90	--	3000	ØD	GR	3	03016	2	0	051.4	SEARS	4	1096.4
5096.3	U	0108	FW	C	VF	HL	90	--	3000	ØD	GR	3	06970	3	0	031.0	SEARS	4	1096.5
6096.3	U	0108	FW	C	VF	LH	90	--	3000	ØD	GR	3	01705	0	0	059.3	SEARS	4	1096.6
1105.3	T	0109	FW	D	DV	LH	40	180	3000	ØD	GR	3	07555	3	0	027.4	SEARS	1	1097.1
2105.3	T	0109	FW	D	DV	MH	40	180	3000	ØD	GR	3	02025	0	0	055.8	SEARS	1	1097.2
3105.3	T	0109	FW	D	DV	HH	40	180	3000	ØD	GR	3	05535	0	2	038.1	SEARS	1	1097.3
4105.3	T	0109	FW	D	DV	LL	40	180	3000	ØD	GR	3	03012	3	0	050.4	SEARS	1	1097.4
5105.3	T	0109	FW	D	DV	ML	40	180	3000	ØD	GR	3	03505	3	0	048.2	SEARS	1	1097.5

6105.3	T	0109	FW	D	DV	HL	40	180	3000	ØD	GR	3	01773	0	0	058.4	SEARS	1	1097.6
1109.4	U	0109	FW	D	DV	LH	40	180	3000	ØD	GR	3	03209	3	0	050.5	RØMANS	1	1098.1
2109.4	U	0109	FW	D	DV	MH	40	180	3000	ØD	GR	3	02406	3	0	054.6	RØMANS	A	1098.2
3109.4	U	0109	FW	D	DV	HH	40	180	3000	ØD	GR	3	02640	0	1	054.1	RØMANS	1	1098.3
4109.4	U	0109	FW	D	DV	LL	40	180	3000	ØD	GR	3	03042	0	1	050.4	RØMANS	1	1098.4
5109.4	U	0109	FW	D	DV	ML	40	180	3000	ØD	GR	3	02808	3	0	051.9	RØMANS	1	1098.5
6109.4	U	0109	FW	D	DV	HL	40	180	3000	ØD	GR	3	03285	3	0	049.8	RØMANS	1	1098.6
1106.3	T	0109	FW	D	NF	LH	40	180	3000	ØD	GR	3	01465	0	0	059.2	SEARS	2	1099.1
2106.3	T	0109	FW	D	NF	MH	40	180	3000	ØD	GR	3	02194	0	0	054.6	SEARS	2	1099.2
3106.3	T	0109	FW	D	NF	HH	40	180	3000	ØD	GR	3	04756	0	2	042.1	SEARS	2	1099.3
4106.3	T	0109	FW	D	NF	LL	40	180	3000	ØD	GR	3	04920	3	0	040.5	SEARS	4	1099.4
5106.3	T	0109	FW	D	NF	ML	40	180	3000	ØD	GR	3	05130	0	5	040.0	SEARS	4	1099.5
6106.3	T	0109	FW	D	NF	HL	40	180	3000	ØD	GR	3	03997	0	2	046.2	SEARS	4	1099.6
1098.3	U	0109	FW	D	NF	LH	40	180	3000	ØD	GR	3	05130	0	4	040.3	RØMANS	1	1100.1
2098.3	U	0109	FW	D	NF	MH	40	180	3000	ØD	GR	3	05595	0	5	037.4	RØMANS	1	1100.2
3098.3	U	0109	FW	D	NF	HH	40	180	3000	ØD	GR	3	07058	0	2	030.6	RØMANS	1	1100.3
4098.3	U	0109	FW	D	NF	LL	40	180	3000	ØD	GR	3	07415	0	1	028.0	RØMANS	1	1100.4
5098.3	U	0109	FW	D	NF	ML	40	180	3000	ØD	GR	3	07245	0	1	029.0	RØMANS	1	1100.5
6098.3	U	0109	FW	D	NF	HL	40	180	3000	ØD	GR	3	06008	0	5	035.7	RØMANS	1	1100.6
1107.3	T	0109	FW	D	WF	LH	40	180	3000	ØD	GR	3	02500	3	0	053.1	SEARS	2	1101.1
2107.3	T	0109	FW	D	WF	MH	40	180	3000	ØD	GR	3	02406	3	0	053.4	SEARS	4	1101.2
3107.3	T	0109	FW	D	WF	HH	40	180	3000	ØD	GR	3	02095	0	0	056.4	SEARS	2	1101.3
4107.3	T	0109	FW	D	WF	LL	40	180	3000	ØD	GR	3	02716	3	0	051.9	SEARS	2	1101.4
5107.3	T	0109	FW	D	WF	ML	40	180	3000	ØD	GR	3	02848	3	0	052.0	SEARS	4	1101.5
6107.3	T	0109	FW	D	WF	HL	40	180	3000	ØD	GR	3	01747	0	0	058.3	SEARS	4	1101.6
1099.3	U	0109	FW	D	WF	LH	40	180	3000	ØD	GR	3	02651	3	0	052.7	RØMANS	1	1102.1
2099.3	U	0109	FW	D	WF	MH	40	180	3000	ØD	GR	3	02835	3	1	051.2	RØMANS	1	1102.2
3099.3	U	0109	FW	D	WF	HH	40	180	3000	ØD	GR	3	03495	0	2	048.9	RØMANS	1	1102.3
4099.3	U	0109	FW	D	WF	LL	40	180	3000	ØD	GR	3	05370	0	3	038.4	RØMANS	1	1102.4
5099.3	U	0109	FW	D	WF	ML	40	180	3000	ØD	GR	3	03905	3	6	046.2	RØMANS	1	1102.5
6099.3	U	0109	FW	D	WF	HL	40	180	3000	ØD	GR	3	03194	3	0	050.4	RØMANS	1	1102.6
1108.4	T	0109	FW	D	VF	LH	40	180	3000	ØD	GR	3	04293	0	2	043.8	SEARS	4	1103.1
2108.4	T	0109	FW	D	VF	MH	40	180	3000	ØD	GR	3	04975	0	1	040.0	SEARS	4	1103.2
3108.4	T	0109	FW	D	VF	HH	40	180	3000	ØD	GR	3	04360	0	2	044.3	SEARS	4	1103.3
4108.4	T	0109	FW	D	VF	LL	40	180	3000	ØD	GR	3	04990	0	1	040.3	SEARS	4	1103.4
5108.4	T	0109	FW	D	VF	ML	40	180	3000	ØD	GR	3	02572	0	1	053.5	SEARS	4	1103.5
6108.4	T	0109	FW	D	VF	HL	40	180	3000	ØD	GR	3	03112	3	0	050.8	SEARS	4	1103.6
1100.4	U	0109	FW	D	VF	LH	40	180	3000	ØD	GR	3	05517	0	2	037.6	RØMANS	1	1104.1
2100.4	U	0109	FW	D	VF	MH	40	180	3000	ØD	GR	3	02535	3	0	052.9	RØMANS	A	1104.2
3100.4	U	0109	FW	D	VF	HH	40	180	3000	ØD	GR	3	04890	0	2	041.4	RØMANS	A	1104.3
4100.4	U	0109	FW	D	VF	LL	40	180	3000	ØD	GR	3	06653	3	0	031.7	RØMANS	A	1104.4
5100.4	U	0109	FW	D	VF	ML	40	180	3000	ØD	GR	3	04952	2	1	040.9	RØMANS	A	1104.5
6100.4	U	0109	FW	D	VF	HL	40	180	3000	ØD	GR	3	02420	3	0	054.5	RØMANS	A	1104.6
1123.3	T	0110	FW	D	DV	LH	40	90	3000	ØD	GR	3	04012	3	0	045.0	SEARS	1	1105.1
2123.3	T	0110	FW	D	DV	MH	40	90	3000	ØD	GR	3	04930	3	1	039.1	SEARS	1	1105.2
3123.3	T	0110	FW	D	DV	HH	40	90	3000	ØD	GR	3	06472	0	2	033.1	SEARS	1	1105.3
4123.3	T	0110	FW	D	DV	LL	40	90	3000	ØD	GR	3	04480	3	0	042.8	SEARS	1	1105.4
5123.3	T	0110	FW	D	DV	ML	40	90	3000	ØD	GR	3	04108	3	0	044.1	SEARS	1	1105.5
6123.3	T	0110	FW	D	DV	HL	40	90	3000	ØD	GR	3	04720	3	0	042.0	SEARS	1	1105.6
1119.5	U	0110	FW	D	DV	LH	40	90	3000	ØD	GR	3	07175	3	0	029.1	RØMANS	1	1106.1
2119.5	U	0110	FW	D	DV	MH	40	90	3000	ØD	GR	3	02877	0	0	051.0	RØMANS	A	1106.2
3119.5	U	0110	FW	D	DV	HH	40	90	3000	ØD	GR	3	07870	0	2	026.2	RØMANS	1	1106.3
4119.5	U	0110	FW	D	DV	LL	40	90	3000	ØD	GR	3	10347	3	0	013.2	RØMANS	1	1106.4

5119.5	U	0110	FW	D	DV	ML	40	90	3000	OD	GR	3	10026	0	3	015.2	ROMANS	1	1106.5
6119.5	U	0110	FW	D	DV	HL	40	90	3000	OD	GR	3	09135	0	3	019.9	ROMANS	1	1106.6
1124.4	T	0110	FW	D	NF	LH	40	90	3000	OD	GR	3	08640	3	0	021.6	SEARS	2	1107.1
2124.4	T	0110	FW	D	NF	MH	40	90	3000	OD	GR	3	02910	0	0	053.0	SEARS	4	1107.2
3124.4	T	0110	FW	D	NF	HH	40	90	3000	OD	GR	3	02310	0	0	054.0	SEARS	4	1107.3
4124.4	T	0110	FW	D	NF	LL	40	90	3000	OD	GR	3	09322	3	1	018.2	SEARS	4	1107.4
5124.4	T	0110	FW	D	NF	ML	40	90	3000	OD	GR	3	07065	0	2	029.4	SEARS	4	1107.5
6124.4	T	0110	FW	D	NF	HL	40	90	3000	OD	GR	3	04114	0	2	044.4	SEARS	4	1107.6
1120.7	U	0110	FW	D	NF	LH	40	90	3000	OD	GR	3	03380	3	0	048.4	ROMANS	4	1108.1
2120.7	U	0110	FW	D	NF	MH	40	90	3000	OD	GR	3	03531	3	0	047.0	ROMANS	4	1108.2
3120.7	U	0110	FW	D	NF	HH	40	90	3000	OD	GR	3	01995	0	0	056.4	ROMANS	1	1108.3
4120.7	U	0110	FW	D	NF	LL	40	90	3000	OD	GR	3	03631	0	1	046.3	ROMANS	1	1108.4
5120.7	U	0110	FW	D	NF	ML	40	90	3000	OD	GR	3	05250	3	0	038.2	ROMANS	4	1108.5
6120.7	U	0110	FW	D	NF	HL	40	90	3000	OD	GR	3	01575	0	0	058.2	ROMANS	4	1108.6
1125.4	T	0110	FW	D	WF	LH	40	90	3000	OD	GR	3	10285	0	8	013.5	SEARS	2	1109.1
2125.4	T	0110	FW	D	WF	MH	40	90	3000	OD	GR	3	05509	3	1	036.9	SEARS	2	1109.2
3125.4	T	0110	FW	D	WF	HH	40	90	3000	OD	GR	3	06199	0	2	034.5	SEARS	2	1109.3
4125.4	T	0110	FW	D	WF	LL	40	90	3000	OD	GR	3	05760	3	0	035.8	SEARS	2	1109.4
5125.4	T	0110	FW	D	WF	ML	40	90	3000	OD	GR	3	05002	0	5	039.7	SEARS	2	1109.5
6125.4	T	0110	FW	D	WF	HL	40	90	3000	OD	GR	3	05872	3	0	036.0	SEARS	2	1109.6
1121.3	U	0110	FW	D	WF	LH	40	90	3000	OD	GR	3	05198	3	0	039.2	ROMANS	1	1110.1
2121.3	U	0110	FW	D	WF	MH	40	90	3000	OD	GR	3	05315	3	0	037.7	ROMANS	1	1110.2
3121.3	U	0110	FW	D	WF	HH	40	90	3000	OD	GR	3	02041	0	0	055.9	ROMANS	1	1110.3
4121.3	U	0110	FW	D	WF	LL	40	90	3000	OD	GR	3	04507	3	0	042.0	ROMANS	1	1110.4
5121.3	U	0110	FW	D	WF	ML	40	90	3000	OD	GR	3	04635	3	1	041.3	ROMANS	1	1110.5
6121.3	U	0110	FW	D	WF	HL	40	90	3000	OD	GR	3	02592	3	0	052.9	ROMANS	1	1110.6
1126.3	T	0110	FW	D	VF	LH	40	90	3000	OD	GR	3	04825	3	0	040.5	SEARS	4	1111.1
2126.3	T	0110	FW	D	VF	MH	40	90	3000	OD	GR	3	02806	0	0	052.6	SEARS	4	1111.2
3126.3	T	0110	FW	D	VF	HH	40	90	3000	OD	GR	3	03199	0	2	049.6	SEARS	4	1111.3
4126.3	T	0110	FW	D	VF	LL	40	90	3000	OD	GR	3	05268	3	0	038.3	SEARS	4	1111.4
5126.3	T	0110	FW	D	VF	ML	40	90	3000	OD	GR	3	03172	3	0	048.9	SEARS	4	1111.5
6126.3	T	0110	FW	D	VF	HL	40	90	3000	OD	GR	3	04062	3	0	045.0	SEARS	4	1111.6
1122.4	U	0110	FW	D	VF	LH	40	90	3000	OD	GR	3	03455	3	0	047.4	ROMANS	1	1112.1
2122.4	U	0110	FW	D	VF	MH	40	90	3000	OD	GR	3	02876	0	0	051.0	ROMANS	1	1112.2
3122.4	U	0110	FW	D	VF	HH	40	90	3000	OD	GR	3	08355	0	2	023.8	ROMANS	4	1112.3
4122.4	U	0110	FW	D	VF	LL	40	90	3000	OD	GR	3	09451	3	0	017.6	ROMANS	4	1112.4
5122.4	U	0110	FW	D	VF	ML	40	90	3000	OD	GR	3	05352	0	1	037.9	ROMANS	4	1112.5
6122.4	U	0110	FW	D	VF	HL	40	90	3000	OD	GR	3	03019	3	0	050.6	ROMANS	1	1112.6
1104.4	T	0109	FW	D	DV	LH	32	135	3000	OD	GR	3	02321	3	0	053.4	ROMANS	1	1113.1
2104.4	T	0109	FW	D	DV	MH	40	135	3000	OD	GR	3	04880	3	2	039.7	ROMANS	1	1113.2
3104.4	T	0109	FW	D	DV	HH	40	135	3000	OD	GR	3	01931	0	0	056.9	ROMANS	1	1113.3
4104.4	T	0109	FW	D	DV	LL	32	135	3000	OD	GR	3	04218	3	0	044.5	ROMANS	1	1113.4
5104.4	T	0109	FW	D	DV	ML	40	135	3000	OD	GR	3	03153	3	0	050.5	ROMANS	1	1113.5
6104.4	T	0109	FW	D	DV	HL	40	135	3000	OD	GR	3	01702	0	0	059.1	ROMANS	1	1113.6
1101.4	U	0109	FW	D	DV	LH	32	135	3000	OD	GR	3	09495	3	0	017.5	ROMANS	1	1114.1
2101.4	U	0109	FW	D	DV	MH	40	135	3000	OD	GR	3	01553	0	0	058.6	ROMANS	1	1114.2
3101.4	U	0109	FW	D	DV	HH	40	135	3000	OD	GR	3	02093	0	1	055.9	ROMANS	1	1114.3
4101.4	U	0109	FW	D	DV	LL	32	135	3000	OD	GR	3	07666	3	0	027.0	ROMANS	1	1114.4
5101.4	U	0109	FW	D	DV	ML	40	135	3000	OD	GR	3	05197	0	4	039.7	ROMANS	1	1114.5
6101.4	U	0109	FW	D	DV	HL	40	135	3000	OD	GR	3	05260	0	2	039.8	ROMANS	1	1114.6
1115.4	T	0110	FW	D	NF	LH	32	135	3000	OD	GR	3	03822	3	0	047.7	ROMANS	4	1115.1
2115.4	T	0110	FW	D	NF	MH	40	135	3000	OD	GR	3	02895	3	0	052.1	ROMANS	4	1115.2
3115.4	T	0110	FW	D	NF	HH	40	135	3000	OD	GR	3	02087	0	0	058.1	ROMANS	4	1115.3

4115.4	T	0110	FW	D	NF	LL	32	135	3000	8D	GR	3	05516	3	0	038.4	RBMANS	4	1115.4
5115.4	T	0110	FW	D	NF	ML	40	135	3000	8D	GR	3	00998	0	0	065.0	RBMANS	1	1115.5
6115.4	T	0110	FW	D	NF	HL	40	135	3000	8D	GR	3	02812	3	0	053.1	RBMANS	1	1115.6
1102.3	U	0109	FW	D	NF	LH	32	135	3000	8D	GR	3	06545	3	0	032.2	RBMANS	5	1116.1
2102.3	U	0109	FW	D	NF	MH	40	135	3000	8D	GR	3	07266	0	3	027.9	RBMANS	1	1116.2
3102.3	U	0109	FW	D	NF	HH	40	135	3000	8D	GR	3	05081	0	2	040.2	RBMANS	1	1116.3
4102.3	U	0109	FW	D	NF	LL	32	135	3000	8D	GR	3	07321	0	3	028.6	RBMANS	1	1116.4
5102.3	U	0109	FW	D	NF	ML	40	135	3000	8D	GR	3	07182	0	3	029.6	RBMANS	4	1116.5
6103.3	U	0109	FW	D	NF	HL	40	135	3000	8D	GR	3	06205	0	3	034.7	RBMANS	4	1116.6
1117.4	T	0110	FW	D	WF	LH	32	135	3000	8D	GR	3	02610	3	0	054.2	RBMANS	1	1117.1
2117.4	T	0110	FW	D	WF	MH	40	135	3000	8D	GR	3	02724	3	0	052.6	RBMANS	1	1117.2
3117.4	T	0110	FW	D	WF	HH	40	135	3000	8D	GR	3	01947	0	0	058.9	RBMANS	1	1117.3
4117.4	T	0110	FW	D	WF	LL	32	135	3000	8D	GR	3	04988	3	0	040.7	RBMANS	1	1117.4
5117.4	T	0110	FW	D	WF	ML	40	135	3000	8D	GR	3	02705	3	0	053.9	RBMANS	1	1117.5
6117.4	T	0110	FW	D	WF	HL	40	135	3000	8D	GR	3	03408	3	0	049.9	RBMANS	1	1117.6
1103.3	U	0109	FW	D	WF	LH	32	135	3000	8D	GR	3	00960	0	0	064.0	RBMANS	4	1118.1
2103.3	U	0109	FW	D	WF	MH	40	135	3000	8D	GR	3	02153	0	1	054.0	RBMANS	1	1118.2
3103.3	U	0109	FW	D	WF	HH	40	135	3000	8D	GR	3	02843	0	1	051.5	RBMANS	4	1118.3
4103.3	U	0109	FW	D	WF	LL	32	135	3000	8D	GR	3	05232	3	0	039.2	RBMANS	4	1118.4
5103.3	U	0109	FW	D	WF	ML	40	135	3000	8D	GR	3	02121	2	0	056.1	RBMANS	0	1118.5
6103.3	U	0109	FW	D	WF	HL	40	135	3000	8D	GR	3	01687	0	0	059.2	RBMANS	1	1118.6
1118.3	T	0110	FW	D	VF	LH	32	135	3000	8D	GR	3	00960	0	0	065.6	RBMANS	1	1119.1
2118.3	T	0110	FW	D	VF	ML	40	135	3000	8D	GR	3	02493	0	1	054.0	RBMANS	1	1119.2
3118.3	T	0110	FW	D	VF	HH	40	135	3000	8D	GR	3	01940	0	0	058.7	RBMANS	1	1119.3
4118.3	T	0110	FW	D	VF	LL	32	135	3000	8D	GR	3	03192	0	2	049.9	RBMANS	4	1119.4
5118.3	T	0110	FW	D	VF	ML	40	135	3000	8D	GR	3	00960	0	0	065.4	RBMANS	1	1119.5
6118.3	T	0110	FW	D	VF	HL	40	135	3000	8D	GR	3	02384	0	1	055.0	RBMANS	1	1119.6
1116.3	U	0110	FW	D	VF	LH	32	135	3000	8D	GR	3	01487	3	0	060.8	RBMANS	1	1120.1
2116.3	U	0110	FW	D	VF	MH	40	135	3000	8D	GR	3	02393	0	3	054.8	RBMANS	4	1120.2
3116.3	U	0110	FW	D	VF	HH	40	135	3000	8D	GR	3	03131	0	3	051.9	RBMANS	4	1120.3
4116.3	U	0110	FW	D	VF	LL	32	135	3000	8D	GR	3	06972	0	3	030.4	RBMANS	4	1120.4
5116.3	U	0110	FW	D	VF	ML	40	135	3000	8D	GR	3	04632	3	0	043.2	RBMANS	4	1120.5
6116.3	U	0110	FW	D	VF	HL	40	135	3000	8D	GR	3	03477	0	3	049.3	RBMANS	4	1120.6
1111.3	T	0109	FW	D	DV	LH	90	--	3000	8D	GR	3	04033	3	0	045.1	SEARS	1	1121.1
2111.3	T	0109	FW	D	DV	MH	90	--	3000	8D	GR	3	02269	3	0	053.8	SEARS	1	1121.2
3111.3	T	0109	FW	D	DV	HH	90	--	3000	8D	GR	3	03252	0	2	049.4	SEARS	1	1121.3
4111.3	T	0109	FW	D	DV	LL	90	--	3000	8D	GR	3	03876	3	0	045.6	SEARS	1	1121.4
5111.3	T	0109	FW	D	DV	ML	90	--	3000	8D	GR	3	04281	3	0	044.2	SEARS	1	1121.5
6111.3	T	0109	FW	D	DV	HL	90	--	3000	8D	GR	3	04279	3	0	044.1	SEARS	1	1121.6
1110.4	U	0109	FW	D	DV	LH	90	--	3000	8D	GR	3	02571	3	0	052.8	SEARS	1	1122.1
2110.4	U	0109	FW	D	DV	MH	90	--	3000	8D	GR	3	02763	3	1	051.4	SEARS	1	1122.2
3110.4	U	0109	FW	D	DV	HH	90	--	3000	8D	GR	3	05850	0	2	036.3	SEARS	1	1122.3
4110.4	U	0109	FW	D	DV	LL	90	--	3000	8D	GR	3	06040	3	0	035.2	SEARS	1	1122.4
5110.4	U	0109	FW	D	DV	ML	90	--	3000	8D	GR	3	04549	3	0	042.8	SEARS	1	1122.5
6110.4	U	0109	FW	D	DV	HL	90	--	3000	8D	GR	3	03982	3	0	045.8	SEARS	1	1122.6
1112.3	T	0109	FW	D	NF	LH	90	--	3000	8D	GR	3	04285	0	2	043.9	SEARS	2	1123.1
2112.3	T	0109	FW	D	NF	MH	90	--	3000	8D	GR	3	04090	0	4	044.4	SEARS	2	1123.2
3112.3	T	0109	FW	D	NF	HH	90	--	3000	8D	GR	3	02070	0	0	056.3	SEARS	2	1123.3
4112.3	T	0109	FW	D	NF	LL	90	--	3000	8D	GR	3	07533	3	0	027.6	SEARS	2	1123.4
5112.3	T	0109	FW	D	NF	ML	90	--	3000	8D	GR	3	07591	3	0	027.4	SEARS	2	1123.5
6112.3	T	0109	FW	D	NF	HL	90	--	3000	8D	GR	3	06004	3	0	035.5	SEARS	2	1123.6
1127.3	U	0113	FW	D	NF	LH	90	--	3000	8D	GR	3	01717	0	0	059.6	SEARS	4	1124.1
2127.3	U	0113	FW	D	NF	MH	90	--	3000	8D	GR	3	04807	3	0	041.3	SEARS	4	1124.2

3127.3	U	0113	FW	D	NF	HH	90	--	3000	ØD	GR	3	06447	0	2	034.1	SEARS	4	1124.3
4127.3	U	0113	FW	D	NF	LL	90	--	3000	ØD	GR	3	06907	3	0	031.8	SEARS	4	1124.4
5127.3	U	0113	FW	D	NF	ML	90	--	3000	ØD	GR	3	06829	0	2	032.4	SEARS	4	1124.5
6127.3	U	0113	FW	D	NF	HL	90	--	3000	ØD	GR	3	02488	0	2	055.7	SEARS	4	1124.6
1113.4	T	0109	FW	D	WF	LH	90	--	3000	ØD	GR	3	01350	0	0	060.7	SEARS	2	1125.1
2113.4	T	0109	FW	D	WF	MH	90	--	3000	ØD	GR	3	05400	3	0	037.7	SEARS	2	1125.2
3113.4	T	0109	FW	D	WF	HH	90	--	3000	ØD	GR	3	03990	0	2	045.8	SEARS	2	1125.3
4113.4	T	0109	FW	D	WF	LL	90	--	3000	ØD	GR	3	07549	3	0	027.7	SEARS	2	1125.4
5113.4	T	0109	FW	D	WF	ML	90	--	3000	ØD	GR	3	05245	0	4	039.3	SEARS	2	1125.5
6113.4	T	0109	FW	D	WF	HL	90	--	3000	ØD	GR	3	03646	3	0	047.7	SEARS	2	1125.6
1128.3	U	0113	FW	D	WF	LH	90	--	3000	ØD	GR	3	03577	3	0	049.3	RØMANS	4	1126.1
2128.3	U	0113	FW	D	WF	MH	90	--	3000	ØD	GR	3	01776	0	0	058.8	RØMANS	7	1126.2
3128.3	U	0113	FW	D	WF	HH	90	--	3000	ØD	GR	3	01920	0	0	059.1	RØMANS	4	1126.3
4128.3	U	0113	FW	D	WF	LL	90	--	3000	ØD	GR	3	03342	3	2	050.5	RØMANS	4	1126.4
5128.3	U	0113	FW	D	WF	ML	90	--	3000	ØD	GR	3	02737	3	0	054.1	RØMANS	7	1126.5
6128.3	U	0113	FW	D	WF	HL	90	--	3000	ØD	GR	3	02055	3	1	058.4	RØMANS	3	1126.6
1114.5	T	0109	FW	D	VF	LH	90	--	3000	ØD	GR	3	05065	3	1	039.9	SEARS	4	1127.1
2114.5	T	0109	FW	D	VF	MH	90	--	3000	ØD	GR	3	07326	3	0	027.8	SEARS	4	1127.2
3114.5	T	0109	FW	D	VF	HH	90	--	3000	ØD	GR	3	01995	0	0	056.7	SEARS	4	1127.3
4114.5	T	0109	FW	D	VF	LL	90	--	3000	ØD	GR	3	02092	0	0	055.8	SEARS	4	1127.4
5114.5	T	0109	FW	D	VF	ML	90	--	3000	ØD	GR	3	01030	0	0	063.5	SEARS	4	1127.5
6114.5	T	0109	FW	D	VF	HL	90	--	3000	ØD	GR	3	01836	0	5	057.5	SEARS	4	1127.6
1129.4	U	0113	FW	D	VF	LH	90	--	3000	ØD	GR	3	02179	3	0	057.0	SEARS	4	1128.1
2129.4	U	0113	FW	D	VF	MH	90	--	3000	ØD	GR	3	01938	0	0	057.8	SEARS	4	1128.2
3129.4	U	0113	FW	D	VF	HH	90	--	3000	ØD	GR	3	02164	0	0	057.4	SEARS	4	1128.3
4129.4	U	0113	FW	D	VF	LL	90	--	3000	ØD	GR	3	04587	3	0	043.8	SEARS	4	1128.4
5129.4	U	0113	FW	D	VF	ML	90	--	3000	ØD	GR	3	07551	3	1	028.6	SEARS	4	1128.5
6129.4	U	0113	FW	D	VF	HL	90	--	3000	ØD	GR	3	02815	3	0	053.8	SEARS	4	1128.6
1138.3	T	0114	FW	E	DV	HL	40	180	3000	ØD	GR	3	01780	0	0	060.1	SEARS	1	1129.1
2138.3	T	0114	FW	E	DV	LH	40	180	3000	ØD	GR	3	08400	3	0	023.9	SEARS	1	1129.2
3138.3	T	0114	FW	E	DV	MH	40	180	3000	ØD	GR	3	08100	0	4	026.6	SEARS	1	1129.3
4138.3	T	0114	FW	E	DV	HH	40	180	3000	ØD	GR	3	05630	0	2	039.2	SEARS	1	1129.4
5138.3	T	0114	FW	E	DV	LL	40	180	3000	ØD	GR	3	01955	0	0	059.6	SEARS	1	1129.5
6138.3	T	0114	FW	E	DV	ML	40	180	3000	ØD	GR	3	04712	0	2	044.7	SEARS	1	1129.6
1129.3	U	0114	FW	E	DV	HL	40	180	3000	ØD	GR	3	01071	0	0	067.9	RØMANS	1	1130.1
2129.3	U	0114	FW	E	DV	LH	40	180	3000	ØD	GR	3	04175	3	0	046.4	RØMANS	1	1130.2
3129.3	U	0114	FW	F	DV	MH	40	180	3000	ØD	GR	3	02040	0	0	058.8	RØMANS	A	1130.3
4129.3	U	0114	FW	E	DV	HH	40	180	3000	ØD	GR	3	01070	0	0	067.7	RØMANS	1	1130.4
5129.3	U	0114	FW	E	DV	LL	40	180	3000	ØD	GR	3	03543	3	0	050.6	RØMANS	1	1130.5
6129.3	U	0114	FW	E	DV	ML	40	180	3000	ØD	GR	3	02826	3	0	055.4	RØMANS	A	1130.6
1139.4	T	0114	FW	E	NF	HL	40	180	3000	ØD	GR	3	05892	3	0	037.8	SEARS	4	1131.1
2139.4	T	0114	FW	E	NF	LH	40	180	3000	ØD	GR	3	07172	3	0	030.4	SEARS	4	1131.2
3139.4	T	0114	FW	E	NF	MH	40	180	3000	ØD	GR	3	12031	0	4	006.0	SEARS	4	1131.3
4139.4	T	0114	FW	E	NF	HH	40	180	3000	ØD	GR	3	01557	0	4	062.0	SEARS	4	1131.4
5139.4	T	0114	FW	E	NF	LL	40	180	3000	ØD	GR	3	06722	3	0	033.4	SEARS	4	1131.5
6139.4	T	0114	FW	E	NF	ML	40	180	3000	ØD	GR	3	07785	3	0	028.4	SEARS	4	1131.6
1130.3	U	0114	FW	E	NF	HL	40	180	3000	ØD	GR	3	03586	0	1	049.3	RØMANS	1	1132.1
2130.3	U	0114	FW	E	NF	LH	40	180	3000	ØD	GR	3	02756	3	0	054.1	RØMANS	1	1132.2
3130.3	U	0114	FW	E	NF	MH	40	180	3000	ØD	GR	3	02857	0	1	054.9	RØMANS	1	1132.3
4130.3	U	0114	FW	E	NF	HH	40	180	3000	ØD	GR	3	05135	0	3	042.0	RØMANS	1	1132.4
5130.3	U	0114	FW	E	NF	LL	40	180	3000	ØD	GR	3	04196	3	0	047.3	RØMANS	1	1132.5
6130.3	U	0114	FW	E	NF	ML	40	180	3000	ØD	GR	3	03091	0	3	054.1	RØMANS	1	1132.6
1140.4	T	0114	FW	E	WF	HL	40	180	3000	ØD	GR	3	01640	0	0	060.9	SEARS	4	1133.1

2140.4	T	0114	FW	E	WF	LH	40	180	3000	ØD	GR	3	05187	3	0	041.0	SEARS	4	1133.2
3140.4	T	0114	FW	E	WF	MH	40	180	3000	ØD	GR	3	04850	0	2	043.9	SEARS	4	1133.3
4140.4	T	0114	FW	E	WF	HH	40	180	3000	ØD	GR	3	06665	3	1	034.2	SEARS	4	1133.4
5140.4	T	0114	FW	E	WF	LL	40	180	3000	ØD	GR	3	04085	3	0	048.1	SEARS	4	1133.5
6140.4	T	0114	FW	E	WF	ML	40	180	3000	ØD	GR	3	03998	3	0	045.8	SEARS	4	1133.6
1131.7	U	0114	FW	E	WF	HL	40	180	3000	ØD	GR	3	01073	0	0	045.7	RØMANS	1	1134.1
2131.7	U	0114	FW	E	WF	LH	40	180	3000	ØD	GR	3	03302	0	4	[illegible]	RØMANS	4	1134.2
3131.7	U	0114	FW	E	WF	MH	40	180	3000	ØD	GR	3	03628	0	1	[illegible]	RØMANS	1	1134.3
4131.7	U	0114	FW	E	WF	HH	40	180	3000	ØD	GR	3	07328	0	3	[illegible]	RØMANS	1	1134.4
5131.7	U	0114	FW	E	WF	LL	40	180	3000	ØD	GR	3	04799	3	0	043.7	RØMANS	1	1134.5
6131.7	U	0114	FW	E	WF	ML	40	180	3000	ØD	GR	3	04539	0	1	045.4	RØMANS	1	1134.6
1141.4	T	0114	FW	E	VF	HL	40	180	3000	ØD	GR	3	05775	0	1	038.4	SEARS	4	1135.1
2141.4	T	0114	FW	E	VF	LH	40	180	3000	ØD	GR	3	08690	3	0	022.5	SEARS	4	1135.2
3141.4	T	0114	FW	E	VF	MH	40	180	3000	ØD	GR	3	08340	3	0	025.5	SEARS	4	1135.3
4141.4	T	0114	FW	E	VF	HH	40	180	3000	ØD	GR	3	06291	3	0	036.[illegible]	SEARS	4	1135.4
5141.4	T	0114	FW	E	VF	LL	40	180	3000	ØD	GR	3	06135	2	0	036.8	SEARS	4	1135.5
6141.4	T	0114	FW	E	VF	ML	40	180	3000	ØD	GR	3	07607	3	0	029.4	SEARS	4	1135.6
1132.3	U	0114	FW	E	VF	HL	40	180	3000	ØD	GR	3	01075	0	0	068.1	RØMANS	4	1136.1
2132.3	U	0114	FW	E	VF	LH	40	180	3000	ØD	GR	3	05363	3	0	040.0	RØMANS	4	1136.2
3132.3	U	0114	FW	E	VF	MH	40	180	3000	ØD	GR	3	02029	0	0	[illegible]	RØMANS	4	1136.3
4132.3	U	0114	FW	E	VF	HH	40	180	3000	ØD	GR	3	01947	0	1	[illegible]	RØMANS	4	1136.4
5132.3	U	0114	FW	E	VF	LL	40	180	3000	ØD	GR	3	01070	0	0	067.4	RØMANS	4	1136.5
6132.3	U	0114	FW	E	VF	ML	40	180	3000	ØD	GR	3	06458	3	0	055.1	RØMANS	2	1136.6
1154.3	T	0115	FW	E	DV	HL	40	90	3000	ØD	GR	3	04314	3	0	044.3	SEARS	1	1137.1
2154.3	T	0115	FW	E	DV	LH	40	90	3000	ØD	GR	3	05525	3	0	037.2	SEARS	1	1137.2
3154.3	T	0115	FW	E	DV	MH	40	90	3000	ØD	GR	3	03333	0	2	053.3	SEARS	1	1137.3
4154.3	T	0115	FW	E	DV	HH	40	90	3000	ØD	GR	3	04775	0	3	043.9	SEARS	1	1137.4
5154.3	T	0115	FW	E	DV	LL	40	90	3000	ØD	GR	3	04300	3	0	044.7	SEARS	1	1137.5
6154.3	T	0115	FW	E	DV	ML	40	90	3000	ØD	GR	3	05208	3	0	041.4	SEARS	1	1137.6
1150.4	U	0115	FW	E	DV	HL	40	90	3000	ØD	GR	3	03761	0	1	046.4	RØMANS	1	1138.1
2150.4	U	0115	FW	E	DV	LH	40	90	3000	ØD	GR	3	03769	0	1	047.5	RØMANS	1	1138.2
3150.4	U	0115	FW	E	DV	MH	40	90	3000	ØD	GR	3	03919	3	0	049.0	RØMANS	1	1138.3
4150.4	U	0115	FW	E	DV	HH	40	90	3000	ØD	GR	3	02199	0	0	057.0	RØMANS	1	1138.4
5150.4	U	0115	FW	E	DV	LL	40	90	3000	ØD	GR	3	05673	3	0	037.7	RØMANS	1	1138.5
6150.4	U	0115	FW	E	DV	ML	40	90	3000	ØD	GR	3	03640	3	0	048.9	RØMANS	1	1138.6
1155.3	T	0115	FW	E	NF	HL	40	90	3000	ØD	GR	3	02293	0	0	055.1	SEARS	4	1139.1
2155.3	T	0115	FW	E	NF	LH	40	90	3000	ØD	GR	3	07185	3	0	023.9	SEARS	4	1139.2
3155.3	T	0115	FW	E	NF	MH	40	90	3000	ØD	GR	3	05151	3	0	040.9	SEARS	4	1139.3
4155.3	T	0115	FW	E	NF	HH	40	90	3000	ØD	GR	3	07365	3	0	029.7	SEARS	4	1139.4
5155.3	T	0115	FW	E	NF	LL	40	90	3000	ØD	GR	3	05759	0	2	037.1	SEARS	4	1139.5
6155.3	T	0115	FW	E	NF	ML	40	90	3000	ØD	GR	3	05233	3	0	041.0	SEARS	4	1139.6
1151.3	U	0115	FW	E	NF	HL	40	90	3000	ØD	GR	3	01875	0	0	061.5	RØMANS	4	1140.1
2151.3	U	0115	FW	E	NF	LH	40	90	3000	ØD	GR	3	02923	0	0	053.5	RØMANS	4	1140.2
3151.3	U	0115	FW	E	NF	MH	40	90	3000	ØD	GR	3	02214	0	0	056.6	RØMANS	7	1140.3
4151.3	U	0115	FW	E	NF	HH	40	90	3000	ØD	GR	3	02218	0	0	057.6	RØMANS	4	1140.4
5151.3	U	0115	FW	E	NF	LL	40	90	3000	ØD	GR	3	03200	3	0	050.9	RØMANS	4	1140.5
6151.3	U	0115	FW	E	NF	ML	40	90	3000	ØD	GR	3	03523	0	3	049.6	RØMANS	4	1140.6
1156.4	T	0115	FW	E	WF	HL	40	90	3000	ØD	GR	3	05726	0	4	037.3	SEARS	4	1141.1
2156.4	T	0115	FW	E	WF	LH	40	90	3000	ØD	GR	3	03421	3		048.1	SEARS	4	1141.2
3156.4	T	0115	FW	E	WF	MH	40	90	3000	ØD	GR	3	03855	0	[illegible]	046.8	SEARS	4	1141.3
4156.4	T	0115	FW	E	WF	HH	40	90	3000	ØD	GR	3	03851	3	1	047.5	SEARS	4	1141.4
5156.4	T	0115	FW	E	WF	LL	40	90	3000	ØD	GR	3	04657	3	0	042.8	SEARS	4	1141.5
6156.4	T	0115	FW	E	WF	ML	40	90	3000	ØD	GR	3	04739	3	0	043.1	SEARS	4	1141.6

1152.3	U	0115	FW	E	WF	HL	40	90	3000	ØD	GR	3	10078	0	1	016.0	RØMANS	1	1142.1
2152.3	U	0115	FW	E	WF	LH	40	90	3000	ØD	GR	3	05721	3	0	038.1	RØMANS	1	1142.2
3152.3	U	0115	FW	E	WF	MH	40	90	3000	ØD	GR	3	02199	0	0	057.4	RØMANS	A	1142.3
4152.3	U	0115	FW	E	WF	HH	40	90	3000	ØD	GR	3	03611	0	1	049.4	RØMANS	1	1142.4
5152.3	U	0115	FW	E	WF	LL	40	90	3000	ØD	GR	3	02232	0	0	056.0	RØMANS	A	1142.5
6152.3	U	0115	FW	E	WF	ML	40	90	3000	ØD	GR	3	06907	0	1	032.0	RØMANS	A	1142.6
1157.4	T	0115	FW	E	VF	HL	40	90	3000	ØD	GR	3	01852	3	0	059.4	SEARS	2	1143.1
2157.4	T	0115	FW	E	VF	LH	40	90	3000	ØD	GR	3	07015	3	0	029.6	SEARS	4	1143.2
3157.4	T	0115	FW	E	VF	MH	40	90	3000	ØD	GR	3	04706	0	3	042.7	SEARS	4	1143.3
4157.4	T	0115	FW	E	VF	HH	40	90	3000	ØD	GR	3	04461	3	0	044.5	SEARS	4	1143.4
5157.4	T	0115	FW	E	VF	LL	40	90	3000	ØD	GR	3	04173	3	0	045.6	SEARS	4	1143.5
6157.4	T	0115	FW	E	VF	ML	40	90	3000	ØD	GR	3	05270	3	0	041.2	SEARS	4	1143.6
1153.4	U	0115	FW	E	VF	HL	40	90	3000	ØD	GR	3	04192	3	0	046.4	RØMANS	1	1144.1
2153.4	U	0115	FW	E	VF	LH	40	90	3000	ØD	GR	3	02888	0	1	053.0	RØMANS	A	1144.2
3153.4	U	0115	FW	E	VF	MH	40	90	3000	ØD	GR	3	04453	0	1	045.3	RØMANS	1	1144.3
4153.4	U	0115	FW	E	VF	HH	40	90	3000	ØD	GR	3	02421	0	0	055.7	RØMANS	4	1144.4
5153.4	U	0115	FW	E	VF	LL	40	90	3000	ØD	GR	3	05290	3	0	038.9	RØMANS	4	1144.5
6153.4	U	0115	FW	E	VF	ML	40	90	3000	ØD	GR	3	05069	3	0	041.4	RØMANS	4	1144.6
1134.7	T	0114	FW	E	DV	HL	32	135	3000	ØD	GR	3	01070	0	0	059.0	RØMANS	1	1145.1
2134.7	T	0114	FW	E	DV	LH	40	135	3000	ØD	GR	3	01814	0	0	057.9	RØMANS	1	1145.2
3134.7	T	0114	FW	E	DV	MH	40	135	3000	ØD	GR	3	05450	3	0	043.9	RØMANS	1	1145.3
4134.7	T	0114	FW	E	DV	HH	32	135	3000	ØD	GR	3	06350	3	0	035.1	RØMANS	1	1145.4
5134.7	T	0114	FW	E	DV	LL	40	135	3000	ØD	GR	3	04961	3	0	042.6	RØMANS	1	1145.5
6134.7	T	0114	FW	E	DV	ML	40	135	3000	ØD	GR	3	04557	3	0	044.9	RØMANS	A	1145.6
1133.3	U	0114	FW	E	DV	HL	32	135	3000	ØD	GR	3	02558	0	1	054.7	RØMANS	1	1146.1
2133.3	U	0114	FW	E	DV	LH	40	135	3000	ØD	GR	3	02557	3	0	054.0	RØMANS	1	1146.2
3133.3	U	0114	FW	E	DV	MH	40	135	3000	ØD	GR	3	02270	0	1	056.7	RØMANS	1	1146.3
4133.3	U	0116	FW	E	DV	HH	32	135	3000	ØD	GR	3	02190	0	0	057.0	SEARS	1	1146.4
5133.3	U	0116	FW	E	DV	LL	40	135	3000	ØD	GR	3	04056	3	0	046.9	SEARS	1	1146.5
6133.3	U	0116	FW	E	DV	ML	40	135	3000	ØD	GR	3	03091	0	2	052.5	SEARS	1	1146.6
1146.4	T	0115	FW	E	NF	HL	32	135	3000	ØD	GR	3	05953	0	3	038.5	RØMANS	7	1147.1
2146.4	T	0115	FW	E	NF	LH	40	135	3000	ØD	GR	3	05327	3	0	041.0	RØMANS	7	1147.2
3146.4	T	0115	FW	E	NF	MH	40	135	3000	ØD	GR	3	02820	0	3	055.4	RØMANS	7	1147.3
4146.4	T	0115	FW	E	NF	HH	32	135	3000	ØD	GR	3	03252	0	2	053.6	RØMANS	7	1147.4
5146.4	T	0115	FW	E	NF	LL	40	135	3000	ØD	GR	3	05191	3	0	042.9	RØMANS	7	1147.5
6146.4	T	0115	FW	E	NF	ML	40	135	3000	ØD	GR	3	01646	0	0	063.8	RØMANS	7	1147.[illegible]
1135.3	U	0114	FW	E	NF	HL	32	135	3000	ØD	GR	3	02338	3	0	055.4	RØMANS	1	[illegible]
2135.3	U	0114	FW	E	NF	LH	40	135	3000	ØD	GR	3	01580	0	0	059.8	RØMANS	1	[illegible]
3135.3	U	0114	FW	E	NF	MH	40	135	3000	ØD	GR	3	02086	0	0	059.0	RØMANS	4	[illegible]
4135.3	U	0116	FW	E	NF	HH	32	135	3000	ØD	GR	3	01734	0	0	059.3	SEARS	4	11[illegible].4
5135.3	U	0116	FW	E	NF	LL	40	135	3000	ØD	GR	3	05591	3	0	038.6	SEARS	4	11[illegible].5
6135.3	U	0116	FW	E	NF	ML	40	135	3000	ØD	GR	3	03899	2	0	047.8	SEARS	4	[illegible]
1147.5	T	0115	FW	E	WF	HL	32	135	3000	ØD	GR	3	01073	0	0	068.2	RØMANS	1	[illegible].1
2147.5	T	0115	FW	E	WF	LH	40	135	3000	ØD	GR	3	04124	3	0	046.8	RØMANS	1	1149.2
3147.5	T	0115	FW	E	WF	MH	40	135	3000	ØD	GR	3	02009	0	0	060.3	RØMANS	1	1149.3
4147.5	T	0115	FW	E	WF	HH	32	135	3000	ØD	GR	3	04545	0	3	046.5	RØMANS	1	1149.4
5147.5	T	0115	FW	E	WF	LL	40	135	3000	ØD	GR	3	03329	3	0	052.9	RØMANS	1	1149.5
6147.5	T	0115	FW	E	WF	ML	40	135	3000	ØD	GR	3	03523	2	0	052.3	RØMANS	1	1149.6
1136.3	U	0114	FW	E	WF	HL	32	135	3000	ØD	GR	3	05660	0	1	039.0	RØMANS	1	1150.1
2136.3	U	0114	FW	E	WF	LH	40	135	3000	ØD	GR	3	04978	3	0	042.1	RØMANS	1	1150.2
3136.3	U	0114	FW	E	WF	MH	40	135	3000	ØD	GR	3	03965	0	1	048.8	RØMANS	1	1150.3
4136.3	U	0116	FW	E	WF	HH	32	135	3000	ØD	GR	3	06317	0	3	034.8	SEARS	4	1150.4
5136.3	U	0116	FW	E	WF	LL	40	135	3000	ØD	GR	3	05341	0	0	039.9	SEARS	4	1150.5

6136.3	U	0116	FW	E	WF	ML	40	135	3000	ØD	GR	3	05845	3	0	037.5	SEARS	4	1150.6
1148.3	T	0115	FW	E	VF	HL	32	135	3000	ØD	GR	3	02150	0	1	059.4	RØMANS	1	1151.1
2148.3	T	0115	FW	E	VF	LH	40	135	3000	ØD	GR	3	06750	3	0	033.2	RØMANS	6	1151.2
3148.3	T	0115	FW	E	VF	MH	40	135	3000	ØD	GR	3	02044	0	0	061.0	RØMANS	5	1151.3
4148.3	T	0115	FW	E	VF	HH	32	135	3000	ØD	GR	3	08775	0	3	023.8	RØMANS	4	1151.4
5148.3	T	0115	FW	E	VF	LL	40	135	3000	ØD	GR	3	05678	3	0	034.0	RØMANS	4	1151.5
6148.3	T	0115	FW	E	VF	ML	40	135	3000	ØD	GR	3	04032	3	0	049.5	RØMANS	4	1151.6
1149.3	U	0115	FW	E	VF	HL	32	135	3000	ØD	GR	3	01837	0	2	062.2	RØMANS	4	1152.1
2149.3	U	0115	FW	E	VF	LH	40	135	3000	ØD	GR	3	05373	3	0	040.9	RØMANS	1	1152.2
3149.3	U	0115	FW	E	VF	MH	40	135	3000	ØD	GR	3	03822	0	2	051.0	RØMANS	4	1152.3
4149.3	U	0115	FW	E	VF	HH	32	135	3000	ØD	GR	3	03390	0	1	052.4	RØMANS	4	1152.4
5149.3	U	0115	FW	E	VF	LL	40	135	3000	ØD	GR	3	05466	3	0	040.8	RØMANS	4	1152.5
6149.3	U	0115	FW	E	VF	ML	40	135	3000	ØD	GR	3	03377	3	0	053.0	RØMANS	4	1152.6
1142.5	T	0114	FW	E	DV	HL	90	--	3000	ØD	GR	3	01350	0	0	063.6	SEARS	1	1153.1
2142.5	T	0114	FW	E	DV	LH	90	--	3000	ØD	GR	3	01820	0	0	059.8	SEARS	1	1153.2
3142.5	T	0114	FW	E	DV	MH	90	--	3000	ØD	GR	3	10160	0	3	015.8	SEARS	1	1153.3
4142.5	T	0114	FW	E	DV	HH	90	--	3000	ØD	GR	3	01313	0	0	064.8	SEARS	1	1153.4
5142.5	T	0114	FW	E	DV	LL	90	--	3000	ØD	GR	3	03312	3	0	052.4	SEARS	1	1153.5
6142.5	T	0114	FW	E	DV	ML	90	--	3000	ØD	GR	3	08484	0	4	024.6	SEARS	1	1153.6
1012.3	U	0116	FW	E	DV	HL	90	--	3000	ØD	GR	3	03622	2	0	048.5	SEARS	1	1154.1
2012.3	U	0116	FW	E	DV	LH	90	--	3000	ØD	GR	3	06524	3	0	032.4	SEARS	1	1154.2
3012.3	U	0116	FW	E	DV	MH	90	--	3000	ØD	GR	3	05047	2	0	040.6	SEARS	1	1154.3
4012.3	U	0116	FW	E	DV	HH	90	--	3000	ØD	GR	3	03553	2	0	048.4	SEARS	1	1154.4
5012.3	U	0116	FW	E	DV	LL	90	--	3000	ØD	GR	3	04084	1	0	045.6	SEARS	1	1154.5
6012.3	U	0116	FW	E	DV	ML	90	--	3000	ØD	GR	3	03560	3	0	048.3	SEARS	1	1154.6
1143.7	T	0114	FW	E	NF	HL	90	--	3000	ØD	GR	3	03162	3	0	053.1	SEARS	2	1155.1
2143.7	T	0114	FW	E	NF	LH	90	--	3000	ØD	GR	3	08829	0	3	021.8	SEARS	2	1155.2
3143.7	T	0114	FW	E	NF	MH	90	--	3000	ØD	GR	3	02325	0	2	058.0	SEARS	4	1155.3
4143.7	T	0114	FW	E	NF	HH	90	--	3000	ØD	GR	3	02760	0	1	055.5	SEARS	4	1155.4
5143.7	T	0114	FW	E	NF	LL	90	--	3000	ØD	GR	3	01630	0	0	061.0	SEARS	4	1155.5
6143.7	T	0114	FW	E	NF	ML	90	--	3000	ØD	GR	3	03725	3	0	050.2	SEARS	4	1155.6
1158.3	U	0116	FW	E	NF	HL	90	--	3000	ØD	GR	3	01727	0	0	058.8	SEARS	2	1156.1
2158.3	U	0116	FW	E	NF	LH	90	--	3000	ØD	GR	3	02350	3	0	054.4	SEARS	4	1156.2
3158.3	U	0116	FW	E	NF	MH	90	--	3000	ØD	GR	3	03005	3	0	051.9	SEARS	2	1156.3
4158.3	U	0116	FW	E	NF	HH	90	--	3000	ØD	GR	3	01701	0	0	060.3	SEARS	4	1156.4
5158.3	U	0116	FW	E	NF	LL	90	--	3000	ØD	GR	3	02732	3	0	054.0	SEARS	4	1156.5
6158.3	U	0116	FW	E	NF	ML	90	--	3000	ØD	GR	3	02961	3	0	052.4	SEARS	4	1156.6
1144.4	T	0114	FW	E	WF	HL	90	--	3000	ØD	GR	3	10641	0	2	013.5	SEARS	4	1157.1
2144.4	T	0114	FW	E	WF	LH	90	--	3000	ØD	GR	3	07008	3	0	032.6	SEARS	4	1157.2
3144.4	T	0114	FW	E	WF	MH	90	--	3000	ØD	GR	3	08532	3	1	024.6	SEARS	4	1157.3
4144.4	T	0114	FW	E	WF	HH	90	--	3000	ØD	GR	3	08795	3	0	023.4	SEARS	4	1157.4
5144.4	T	0114	FW	E	WF	LL	90	--	3000	ØD	GR	3	07176	0	1	031.7	SEARS	4	1157.5
6144.4	T	0114	FW	E	WF	ML	90	--	3000	ØD	GR	3	08820	0	1	023.0	SEARS	4	1157.6
1159.3	U	0116	FW	E	WF	HL	90	--	3000	ØD	GR	3	02926	0	2	053.1	SEARS	4	1158.1
2159.3	U	0116	FW	E	WF	LH	90	--	3000	ØD	GR	3	03992	3	0	046.1	SEARS	4	1158.2
3159.3	U	0116	FW	E	WF	MH	90	--	3000	ØD	GR	3	04605	0	2	043.7	SEARS	4	1158.3
4159.3	U	0116	FW	E	WF	HH	90	--	3000	ØD	GR	3	03963	3	0	047.6	SEARS	4	1158.4
5159.3	U	0116	FW	E	WF	LL	90	--	3000	ØD	GR	3	03527	3	0	049.3	SEARS	4	1158.5
6159.3	U	0116	FW	E	WF	ML	90	--	3000	ØD	GR	3	02992	3	0	052.2	SEARS	4	1158.6
1145.3	T	0114	FW	E	VF	HL	90	--	3000	ØD	GR	3	05960	0	1	038.4	SEARS	4	1159.1
2145.3	T	0114	FW	E	VF	LH	90	--	3000	ØD	GR	3	06380	0	4	035.2	SEARS	4	1159.2
3145.3	T	0114	FW	E	VF	MH	90	--	3000	ØD	GR	3	05255	0	2	042.2	SEARS	4	1159.3
4145.3	T	0114	FW	E	VF	HH	90	--	3000	ØD	GR	3	07320	0	3	031.2	SEARS	4	1159.4

5145.3	T	0114	FW	E	VF	LL	90	--	3000	0D	GR	3	06845	0	1	033.6	SEARS	4	1159.5
6145.3	T	0114	FW	E	VF	ML	90	--	3000	0D	GR	3	05372	0	2	041.5	SEARS	4	1159.6
1160.3	U	0116	FW	E	VF	HL	90	--	3000	0D	GR	3	05310	0	3	040.4	SEARS	5	1160.1
2160.3	U	0116	FW	E	VF	LH	90	--	3000	0D	GR	3	06640	3	0	032.3	SEARS	4	1160.2
3160.3	U	0116	FW	E	VF	MH	90	--	3000	0D	GR	3	02994	2	1	051.7	SEARS	4	1160.3
4160.3	U	0116	FW	E	VF	HH	90	--	3000	0D	GR	3	01282	0	0	063.1	SEARS	4	1160.4
5160.3	U	0116	FW	E	VF	LL	90	--	3000	0D	GR	3	03186	3	0	051.0	SEARS	4	1160.5
6160.3	U	0116	FW	E	VF	ML	90	--	3000	0D	GR	3	05948	3	0	036.6	SEARS	5	1160.6
1169.3	T	0117	FW	F	DV	ML	40	180	3000	0D	GR	3	04477	3	0	043.8	SEARS	1	1161.1
2169.3	T	0117	FW	F	DV	HL	40	180	3000	0D	GR	3	01496	3	0	060.5	SEARS	1	1161.2
3169.3	T	0117	FW	F	DV	LH	40	180	3000	0D	GR	3	04871	3	0	042.3	SEARS	1	1161.3
4169.3	T	0117	FW	F	DV	MH	40	180	3000	0D	GR	3	01238	0	0	062.2	SEARS	1	1161.4
5169.3	T	0117	FW	F	DV	HH	40	180	3000	0D	GR	3	04179	0	1	045.9	SEARS	1	1161.5
6169.3	T	0117	FW	F	DV	LL	40	180	3000	0D	GR	3	05600	3	0	038.2	SEARS	1	1161.6
1161.3	U	0117	FW	F	DV	ML	40	180	3000	0D	GR	3	01531	0	0	061.7	SEARS	1	1162.1
2161.3	U	0117	FW	F	DV	HL	40	180	3000	0D	GR	3	02157	0	0	057.0	SEARS	1	1162.2
3161.3	U	0117	FW	F	DV	LH	40	180	3000	0D	GR	3	02514	3	0	056.2	SEARS	1	1162.3
4161.3	U	0117	FW	F	DV	MH	40	180	3000	0D	GR	3	02703	0	2	053.0	SEARS	1	1162.4
5161.3	U	0117	FW	F	DV	HH	40	180	3000	0D	GR	3	03327	3	0	050.3	SEARS	1	1162.5
6161.3	U	0117	FW	F	DV	LL	40	180	3000	0D	GR	3	01822	0	0	059.1	SEARS	1	1162.6
1170.4	T	0117	FW	F	NF	ML	40	180	3000	0D	GR	3	01482	0	0	060.2	SEARS	4	1163.1
2170.4	T	0117	FW	F	NF	HL	40	180	3000	0D	GR	3	04556	0	2	042.8	SEARS	4	1163.2
3170.4	T	0117	FW	F	NF	LH	40	180	3000	0D	GR	3	09628	0	2	018.0	SEARS	4	1163.3
4170.4	T	0117	FW	F	NF	MH	40	180	3000	0D	GR	3	09265	0	3	019.5	SEARS	4	1163.4
5170.4	T	0117	FW	F	NF	HH	40	180	3000	0D	GR	3	05385	0	2	039.5	SEARS	4	1163.5
6170.4	T	0117	FW	F	NF	LL	40	180	3000	0D	GR	3	06764	0	2	032.7	SEARS	4	1163.6
1163.3	U	0117	FW	F	NF	ML	40	180	3000	0D	GR	3	01670	0	0	059.7	SEARS	4	1164.1
2163.3	U	0117	FW	F	NF	HL	40	180	3000	0D	GR	3	04695	0	1	042.6	SEARS	4	1164.2
3163.3	U	0117	FW	F	NF	LH	40	180	3000	0D	GR	3	08672	0	4	023.0	SEARS	4	1164.3
4163.3	U	0117	FW	F	NF	MH	40	180	3000	0D	GR	3	10276	0	5	014.3	SEARS	4	1164.4
5163.3	U	0117	FW	F	NF	HH	40	180	3000	0D	GR	3	04651	0	3	044.1	SEARS	4	1164.5
6163.3	U	0117	FW	F	NF	LL	40	180	3000	0D	GR	3	08676	3	0	022.8	SEARS	4	1164.6
1171.3	T	0117	FW	F	WF	ML	40	180	3000	0D	GR	3	03723	0	3	047.4	SEARS	4	1165.1
2171.3	T	0117	FW	F	WF	HL	40	180	3000	0D	GR	3	02146	0	0	055.9	SEARS	4	1165.2
3171.3	T	0117	FW	F	WF	LH	40	180	3000	0D	GR	3	03406	3	0	050.0	SEARS	4	1165.3
4171.3	T	0117	FW	F	WF	MH	40	180	3000	0D	GR	3	04778	0	3	041.9	SEARS	4	1165.4
5171.3	T	0117	FW	F	WF	HH	40	180	3000	0D	GR	3	02670	0	4	053.7	SEARS	4	1165.5
6171.3	T	0117	FW	F	WF	LL	40	180	3000	0D	GR	3	03651	3	0	048.7	SEARS	4	1165.6
1162.3	U	0117	FW	F	WF	ML	40	180	3000	0D	GR	3	06698	3	0	033.3	SEARS	4	1166.1
2162.3	U	0117	FW	F	WF	HL	40	180	3000	0D	GR	3	04347	0	4	045.0	SEARS	4	1166.2
3162.3	U	0117	FW	F	WF	LH	40	180	3000	0D	GR	3	06731	3	0	033.4	SEARS	4	1166.3
4162.3	U	0117	FW	F	WF	MH	40	180	3000	0D	GR	3	03410	0	1	050.3	SEARS	4	1166.4
5162.3	U	0117	FW	F	WF	HH	40	180	3000	0D	GR	3	01692	0	0	060.9	SEARS	4	1166.5
6162.3	U	0117	FW	F	WF	LL	40	180	3000	0D	GR	3	02569	0	1	056.0	SEARS	4	1166.6
1172.4	T	0117	FW	F	VF	ML	40	180	3000	0D	GR	3	01839	0	0	057.8	SEARS	4	1167.1
2172.4	T	0117	FW	F	VF	HL	40	180	3000	0D	GR	3	05087	0	2	040.0	SEARS	4	1167.2
3172.4	T	0117	FW	F	VF	LH	40	180	3000	0D	GR	3	05296	0	3	040.2	SEARS	4	1167.3
4172.4	T	0117	FW	F	VF	MH	40	180	3000	0D	GR	3	01928	0	1	057.5	SEARS	4	1167.4
5172.4	T	0117	FW	F	VF	HH	40	180	3000	0D	GR	3	02068	0	0	057.1	SEARS	4	1167.5
6172.4	T	0117	FW	F	VF	LL	40	180	3000	0D	GR	3	07553	3	0	028.4	SEARS	4	1167.6
1164.3	U	0117	FW	F	VF	ML	40	180	3000	0D	GR	3	01703	0	0	059.7	SEARS	4	1168.1
2164.3	U	0117	FW	F	VF	HL	40	180	3000	0D	GR	3	05710	0	2	037.4	SEARS	4	1168.2
3164.3	U	0117	FW	F	VF	LH	40	180	3000	0D	GR	3	09954	3	0	016.3	SEARS	4	1168.3

4164.3	U	0117	FW	F	VF	MH	40	180	3000	ØD	GR	3	06004	0	3	036.5	SEARS	4	1168.4
5164.3	U	0117	FW	F	VF	HH	40	180	3000	ØD	GR	3	01458	0	0	062.2	SEARS	4	1168.5
6164.3	U	0117	FW	F	VF	LL	40	180	3000	ØD	GR	3	08052	3	0	026.5	SEARS	4	1168.6
1186.3	T	0120	FW	F	DV	ML	40	090	3000	ØD	GR	3	05748	3	0	037.4	SEARS	1	1169.1
2186.3	T	0120	FW	F	DV	HL	40	090	3000	ØD	GR	3	05153	0	2	039.7	SEARS	1	1169.2
3186.3	T	0120	FW	F	DV	LH	40	090	3000	ØD	GR	3	05984	3	0	037.7	SEARS	1	1169.3
4186.3	T	0120	FW	F	DV	MH	40	090	3000	ØD	GR	3	03362	3	0	050.4	SEARS	1	1169.4
5186.3	T	0120	FW	F	DV	HH	40	090	3000	ØD	GR	3	03620	0	2	050.9	SEARS	1	1169.5
6186.3	T	0120	FW	F	DV	LL	40	090	3000	ØD	GR	3	05332	3	0	041.4	SEARS	1	1169.6
1182.3	U	0120	FW	F	DV	ML	40	090	3000	ØD	GR	3	05503	0	1	038.2	RØMANS	1	1170.1
2182.3	U	0120	FW	F	DV	HL	40	090	3000	ØD	GR	3	02954	0	0	051.6	RØMANS	A	1170.2
3182.3	U	0120	FW	F	DV	LH	40	090	3000	ØD	GR	3	07354	3	0	029.8	RØMANS	1	1170.
4182.3	U	0120	FW	F	DV	MH	40	090	3000	ØD	GR	3	06272	0	1	034.3	RØMANS	1	1170.4
5182.3	U	0120	FW	F	DV	HH	40	090	3000	ØD	GR	3	06146	0	2	034.8	RØMANS	1	1170.
6182.3	U	0120	FW	F	DV	LL	40	090	3000	ØD	GR	3	07118	0	1	031.4	RØMANS	1	1170.
1187.3	T	0120	FW	F	NF	ML	40	090	3000	ØD	GR	3	02674	3	0	053.9	SEARS	4	1171.1
2187.3	T	0120	FW	F	NF	HL	40	090	3000	ØD	GR	3	03042	3	0	051.5	SEARS	4	1171.
3187.3	T	0120	FW	F	NF	LH	40	090	3000	ØD	GR	3	02831	3	0	054.3	SEARS	4	1171.3
4187.3	T	0120	FW	F	NF	MH	40	090	3000	ØD	GR	3	02337	0	0	056.1	SEARS	4	1171.
5187.3	T	0120	FW	F	NF	HH	40	090	3000	ØD	GR	3	02161	0	0	059.3	SEARS	4	1171.5
6187.3	T	0120	FW	F	NF	LL	40	090	3000	ØD	GR	3	04829	3	0	043.9	SEARS	4	1171.6
1183.3	U	0120	FW	F	NF	ML	40	090	3000	ØD	GR	3	07473	2	0	028.4	RØMANS	4	1172.1
2183.3	U	0120	FW	F	NF	HL	40	090	3000	ØD	GR	3	02961	0	2	052.4	RØMANS	4	1172.
3183.3	U	0120	FW	F	NF	LH	40	090	3000	ØD	GR	3	03238	0	2	051.3	RØMANS	4	1172.3
4183.3	U	0120	FW	F	NF	MH	40	090	3000	ØD	GR	3	02192	0	0	056.4	RØMANS	7	1172.4
5183.3	U	0120	FW	F	NF	HH	40	090	3000	ØD	GR	3	04010	0	3	045.7	RØMANS	7	1172.5
6183.3	U	0120	FW	F	NF	LL	40	090	3000	ØD	GR	3	06903	0	1	031.9	RØMANS	1	1172.6
1188.3	T	0120	FW	F	WF	ML	40	090	3000	ØD	GR	3	04547	3	0	043.7	SEARS	4	1173.1
2188.3	T	0120	FW	F	WF	HL	40	090	3000	ØD	GR	3	04177	0	1	045.1	SEARS	4	1173.2
3188.3	T	0120	FW	F	WF	LH	40	090	3000	ØD	GR	3	04778	3	0	043.7	SEARS	4	1173.3
4188.3	T	0120	FW	F	WF	MH	40	090	3000	ØD	GR	3	06620	3	0	033.4	SEARS	4	1173.4
5188.3	T	0120	FW	F	WF	HH	40	090	3000	ØD	GR	3	05786	3	0	037.8	SEARS	4	1173.5
6188.3	T	0120	FW	F	WF	LL	40	090	3000	ØD	GR	3	02892	0	2	054.4	SEARS	4	1173.6
1184.3	U	0120	FW	F	WF	ML	40	090	3000	ØD	GR	3	07813	0	3	026.8	RØMANS	A	1174.1
2184.3	U	0120	FW	F	WF	HL	40	090	3000	ØD	GR	3	10842	0	2	010.7	RØMANS	1	1174.2
3184.3	U	0120	FW	F	WF	LH	40	090	3000	ØD	GR	3	04693	3	0	043.6	RØMANS	4	1174.3
4184.3	U	0120	FW	F	WF	MH	40	090	3000	ØD	GR	3	03680	0	1	047.7	RØMANS	1	1174.4
5184.3	U	0120	FW	F	WF	HH	40	090	3000	ØD	GR	3	05030	0	1	040.7	RØMANS	1	1174.5
6184.3	U	0120	FW	F	WF	LL	40	090	3000	ØD	GR	3	03792	0	1	048.1	RØMANS	1	1174.
1189.3	T	0120	FW	F	VF	ML	40	090	3000	ØD	GR	3	02820	3	0	053.2	SEARS	4	1175.1
2189.3	T	0120	FW	F	VF	HL	40	090	3000	ØD	GR	3	02884	0	0	052.3	SEARS	4	1175.2
3189.3	T	0120	FW	F	VF	LH	40	090	3000	ØD	GR	3	07698	3	0	028.7	SEARS	4	1175.3
4189.3	T	0120	FW	F	VF	MH	40	090	3000	ØD	GR	3	04029	0	3	047.1	SEARS	4	1175.4
5189.3	T	0120	FW	F	VF	HH	40	090	3000	ØD	GR	3	02132	0	0	058.6	SEARS	4	1175.
6189.3	T	0120	FW	F	VF	LL	40	090	3000	ØD	GR	3	03494	3	0	051.0	SEARS	4	1175.
1185.4	U	0120	FW	F	VF	ML	40	090	3000	ØD	GR	3	02003	0	0	058.1	RØMANS	4	1176.1
2185.4	U	0120	FW	F	VF	HL	40	090	3000	ØD	GR	3	03157	0	1	050.0	RØMANS	7	1176.2
3185.4	U	0120	FW	F	VF	LH	40	090	3000	ØD	GR	3	09580	0	3	018.4	RØMANS	5	1176.3
4185.4	U	0120	FW	F	VF	MH	40	090	3000	ØD	GR	3	02195	0	0	056.8	RØMANS	5	1176.4
5185.4	U	0120	FW	F	VF	HH	40	090	3000	ØD	GR	3	02274	0	0	056.6	RØMANS	5	1176.5
6185.4	U	0120	FW	F	VF	LL	40	090	3000	ØD	GR	3	03435	0	1	050.8	RØMANS	5	1176.6
1168.4	T	0117	FW	F	DV	ML	32	135	3000	ØD	GR	3	03346	0	1	049.6	SEARS	1	1177.1
2168.4	T	0117	FW	F	DV	HL	40	135	3000	ØD	GR	3	10871	0	4	010.4	SEARS	1	1177.2

3168.4	T	0117	FW	F	DV	LH	40	135	3000	ØD	GR	3	03520	3	0	050.1	SEARS	1	1177.3
4168.4	T	0117	FW	F	DV	MH	32	135	3000	ØD	GR	3	07742	0	4	027.0	SEARS	1	1177.4
5168.4	T	0117	FW	F	DV	HH	40	135	3000	ØD	GR	3	06111	2	1	035.8	SEARS	1	1177.5
6168.4	T	0117	FW	F	DV	LL	40	135	3000	ØD	GR	3	07180	3	0	030.4	SEARS	1	1177.6
1165.3	U	0117	FW	F	DV	ML	32	135	3000	ØD	GR	3	06486	0	1	033.5	SEARS	1	1178.1
2165.3	U	0117	FW	F	DV	HL	40	135	3000	ØD	GR	3	10186	0	1	014.0	SEARS	1	1178.2
3165.3	U	0117	FW	F	DV	LH	40	135	3000	ØD	GR	3	07839	3	0	027.3	SEARS	1	1178.3
4165.3	U	0117	FW	F	DV	MH	32	135	3000	ØD	GR	3	06583	0	4	032.1	SEARS	1	1178.4
5165.3	U	0117	FW	F	DV	HH	40	135	3000	ØD	GR	3	09421	0	3	019.0	SEARS	1	1178.5
6165.3	U	0117	FW	F	DV	LL	40	135	3000	ØD	GR	3	09743	0	2	017.7	SEARS	1	1178.6
1178.4	T	0120	FW	F	NF	ML	32	135	3000	ØD	GR	3	01090	0	0	064.8	RØMANS	4	1179.1
2178.4	T	0120	FW	F	NF	HL	40	135	3000	ØD	GR	3	01584	0	0	059.9	RØMANS	7	1179.2
3178.4	T	0120	FW	F	NF	LH	40	135	3000	ØD	GR	3	02057	0	0	058.4	RØMANS	7	1179.3
4178.4	T	0120	FW	F	NF	MH	32	135	3000	ØD	GR	3	10489	0	3	013.0	RØMANS	4	1179.4
5178.4	T	0120	FW	F	NF	HH	40	135	3000	ØD	GR	3	06541	1	2	033.7	RØMANS	4	1179.5
6178.4	T	0120	FW	F	NF	LL	40	135	3000	ØD	GR	3	03800	3	0	047.5	RØMANS	4	1179.6
1166.3	U	0117	FW	F	NF	ML	32	135	3000	ØD	GR	3	02368	0	2	055.5	SEARS	4	1180.1
2166.3	U	0117	FW	F	NF	HL	40	135	3000	ØD	GR	3	03695	0	2	047.7	SEARS	4	1180.2
3166.3	U	0117	FW	F	NF	LH	40	135	3000	ØD	GR	3	04197	0	3	046.3	SEARS	4	1180.3
4166.3	U	0117	FW	F	NF	MH	32	135	3000	ØD	GR	3	03148	0	1	050.0	SEARS	1	1180.4
5166.3	U	0117	FW	F	NF	HH	40	135	3000	ØD	GR	3	03611	0	1	047.9	SEARS	4	1180.5
6166.3	U	0117	FW	F	NF	LL	40	135	3000	ØD	GR	3	03651	0	1	048.6	SEARS	4	1180.6
1179.4	T	0120	FW	F	WF	ML	32	135	3000	ØD	GR	3	06997	0	4	031.1	RØMANS	5	1181.1
2179.4	T	0120	FW	F	WF	HL	40	135	3000	ØD	GR	3	02599	3	0	053.5	RØMANS	4	1181.2
3179.4	T	0120	FW	F	WF	LH	40	135	3000	ØD	GR	3	06482	3	0	034.1	RØMANS	1	1181.3
4179.4	T	0120	FW	F	WF	MH	32	135	3000	ØD	GR	3	06530	0	4	033.0	RØMANS	3	1181.4
5179.4	T	0120	FW	F	WF	HH	40	135	3000	ØD	GR	3	03653	1	0	048.4	RØMANS	1	1181.5
6179.4	T	0120	FW	F	WF	LL	40	135	3000	ØD	GR	3	03247	0	2	051.2	RØMANS	5	1181.6
1167.3	U	0117	FW	F	WF	ML	32	135	3000	ØD	GR	3	09275	0	3	019.5	SEARS	2	1182.1
2167.3	U	0117	FW	F	WF	HL	40	135	3000	ØD	GR	3	11635	0	1	007.5	SEARS	2	1182.2
3167.3	U	0117	FW	F	WF	LH	40	135	3000	ØD	GR	3	05451	0	7	040.5	SEARS	4	1182.3
4167.3	U	0117	FW	F	WF	MH	32	135	3000	ØD	GR	3	02954	0	1	050.8	SEARS	4	1182.4
5167.3	U	0117	FW	F	WF	HH	40	135	3000	ØD	GR	3	05428	3	0	038.8	SEARS	4	1182.5
6167.3	U	0117	FW	F	WF	LL	40	135	3000	ØD	GR	3	06277	0	1	034.6	SEARS	4	1182.6
1180.3	T	0120	FW	F	VF	ML	32	135	3000	ØD	GR	3	01075	0	0	065.1	RØMANS	4	1183.1
2180.3	T	0120	FW	F	VF	HL	40	135	3000	ØD	GR	3	03972	0	3	046.0	RØMANS	4	1183.2
3180.3	T	0120	FW	F	VF	LH	40	135	3000	ØD	GR	3	08045	3	0	026.0	RØMANS	4	1183.3
4180.3	T	0120	FW	F	VF	MH	32	135	3000	ØD	GR	3	09167	0	8	019.9	RØMANS	4	1183.4
5180.3	T	0120	FW	F	VF	HH	40	135	3000	ØD	GR	3	03532	0	1	049.2	RØMANS	4	1183.5
6180.3	T	0120	FW	F	VF	LL	40	135	3000	ØD	GR	3	05237	3	0	040.4	RØMANS	1	1183.6
1181.4	U	0120	FW	F	VF	ML	32	135	3000	ØD	GR	3	01090	0	0	066.3	RØMANS	2	1184.1
2181.4	U	0120	FW	F	VF	HL	40	135	3000	ØD	GR	3	02632	3	0	052.8	RØMANS	2	1184.2
3181.4	U	0120	FW	F	VF	LH	40	135	3000	ØD	GR	3	03219	3	0	050.6	RØMANS	4	1184.3
4181.4	U	0120	FW	F	VF	MH	32	135	3000	ØD	GR	3	01414	0	1	060.5	RØMANS	1	1184.4
5181.4	U	0120	FW	F	VF	HH	40	135	3000	ØD	GR	3	01280	0	0	062.2	RØMANS	4	1184.5
6181.4	U	0120	FW	F	VF	LL	40	135	3000	ØD	GR	3	01824	0	0	058.5	RØMANS	1	1184.6
1174.7	T	0117	FW	F	DV	ML	90	--	3000	ØD	GR	3	04724	0	2	042.5	SEARS	1	1185.1
2174.7	T	0117	FW	F	DV	HL	90	--	3000	ØD	GR	3	06319	0	1	033.7	SEARS	1	1185.2
3174.7	T	0117	FW	F	DV	LH	90	--	3000	ØD	GR	3	06955	3	0	031.5	SEARS	1	1185.3
4174.7	T	0117	FW	F	DV	MH	90	--	3000	ØD	GR	3	05644	0	4	038.9	SEARS	1	1185.4
5174.7	T	0117	FW	F	DV	HH	90	--	3000	ØD	GR	3	04924	0	1	041.8	SEARS	1	1185.5
6174.7	T	0117	FW	F	DV	LL	90	--	3000	ØD	GR	3	04752	0	1	042.7	SEARS	1	1185.6
1173.6	U	0117	FW	F	DV	ML	90	--	3000	ØD	GR	3	08782	0	3	022.[illegible]	SEARS	1	1186.1

2173.6	U	0117	FW	F	DV	HL	90	--	3000	8D	GR	3	08522	0	3	022.5	SEARS	1	1186.2
3173.6	U	0117	FW	F	DV	LH	90	--	3000	8D	GR	3	04940	0	2	042.0	SEARS	1	1186.3
4173.6	U	0117	FW	F	DV	MH	90	--	3000	8D	GR	3	01399	0	0	061.5	SEARS	1	1186.4
5173.6	U	0117	FW	F	DV	HH	90	--	3000	8D	GR	3	02417	0	2	055.2	SEARS	1	1186.5
6173.6	U	0117	FW	F	DV	LL	90	--	3000	8D	GR	3	01784	0	0	059.0	SEARS	1	1186.6
1175.3	T	0117	FW	F	NF	ML	90	--	3000	8D	GR	3	08170	3	0	025.1	SEARS	4	1187.1
2175.3	T	0117	FW	F	NF	HL	90	--	3000	8D	GR	3	06497	0	2	033.0	SEARS	4	1187.2
3175.3	T	0117	FW	F	NF	LH	90	--	3000	8D	GR	3	02626	0	0	054.3	SEARS	4	1187.3
4175.3	T	0117	FW	F	NF	MH	90	--	3000	8D	GR	3	01150	0	0	064.5	SEARS	4	1187.4
5175.3	T	0117	FW	F	NF	HH	90	--	3000	8D	GR	3	01201	0	0	063.3	SEARS	4	1187.5
6175.3	T	0117	FW	F	NF	LL	90	--	3000	8D	GR	3	08943	3	0	021.3	SEARS	4	1187.6
1190.3	U	0121	FW	F	NF	ML	90	--	3000	8D	GR	3	04051	3	0	048.3	SEARS	4	1188.1
2190.3	U	0121	FW	F	NF	HL	90	--	3000	8D	GR	3	05031	3	0	041.0	SEARS	4	1188.2
3190.3	U	0121	FW	F	NF	LH	90	--	3000	8D	GR	3	04739	3	0	044.4	SEARS	4	1188.3
4190.3	U	0121	FW	F	NF	MH	90	--	3000	8D	GR	3	01570	0	0	062.5	SEARS	4	1188.4
5190.3	U	0121	FW	F	NF	HH	90	--	3000	8D	GR	3	01487	0	0	062.9	SEARS	4	1188.5
6190.3	U	0121	FW	F	NF	LL	90	--	3000	8D	GR	3	06134	3	0	036.8	SEARS	4	1188.6
1176.3	T	0117	FW	F	WF	ML	90	--	3000	8D	GR	3	03228	3	0	050.5	SEARS	4	1189.1
2176.3	T	0117	FW	F	WF	HL	90	--	3000	8D	GR	3	04144	3	0	044.3	SEARS	4	1189.2
3176.3	T	0117	FW	F	WF	LH	90	--	3000	8D	GR	3	05248	3	0	040.2	SEARS	4	1189.3
4176.3	T	0117	FW	F	WF	MH	90	--	3000	8D	GR	3	01912	0	0	057.7	SEARS	4	1189.4
5176.3	T	0117	FW	F	WF	HH	90	--	3000	8D	GR	3	01754	0	0	059.3	SEARS	4	1189.5
6176.3	T	0117	FW	F	WF	LL	90	--	3000	8D	GR	3	05721	3	0	037.7	SEARS	4	1189.6
1191.3	U	0121	FW	F	WF	ML	90	--	3000	8D	GR	3	04510	0	1	045.2	SEARS	4	1190.1
2191.3	U	0121	FW	F	WF	HL	90	--	3000	8D	GR	3	05426	0	1	039.6	SEARS	4	1190.2
3191.3	U	0121	FW	F	WF	LH	90	--	3000	8D	GR	3	05351	0	2	040.8	SEARS	4	1190.3
4191.3	U	0121	FW	F	WF	MH	90	--	3000	8D	GR	3	01771	0	0	060.5	SEARS	4	1190.4
5191.3	U	0121	FW	F	WF	HH	90	--	3000	8D	GR	3	03767	3	0	049.4	SEARS	4	1190.5
6191.3	U	0121	FW	F	WF	LL	90	--	3000	8D	GR	3	03596	0	1	050.7	SEARS	4	1190.6
1177.3	T	0117	FW	F	VF	ML	90	--	3000	8D	GR	3	03058	3	0	051.5	SEARS	6	1191.1
2177.3	T	0117	FW	F	VF	HL	90	--	3000	8D	GR	3	03362	0	4	049.1	SEARS	6	1191.2
3177.3	T	0117	FW	F	VF	LH	90	--	3000	8D	GR	3	03972	3	0	046.8	SEARS	6	1191.3
4177.3	T	0117	FW	F	VF	MH	90	--	3000	8D	GR	3	01471	0	0	060.7	SEARS	6	1191.4
5177.3	T	0117	FW	F	VF	HH	90	--	3000	8D	GR	3	03434	3	1	049.7	SEARS	6	1191.5
6177.3	T	0117	FW	F	VF	LL	90	--	3000	8D	GR	3	01992	0	4	057.7	SEARS	6	1191.6
1192.3	U	0121	FW	F	VF	ML	90	--	3000	8D	GR	3	07447	3	0	029.6	SEARS	4	1192.1
2192.3	U	0121	FW	F	VF	HL	90	--	3000	8D	GR	3	06513	3	0	034.7	SEARS	4	1192.2
3192.3	U	0121	FW	F	VF	LH	90	--	3000	8D	GR	3	06341	3	0	035.5	SEARS	4	1192.3
4192.3	U	0121	FW	F	VF	MH	90	--	3000	8D	GR	3	01853	0	0	059.0	SEARS	4	1192.4
5192.3	U	0121	FW	F	VF	HH	90	--	3000	8D	GR	3	02384	0	2	056.7	SEARS	4	1192.5
6192.3	U	0121	FW	F	VF	LL	90	--	3000	8D	GR	3	01808	0	0	060.5	SEARS	4	1192.6

****** DATA FRØM SEEKVAL EXPERIMENT 2 ******

1245.3	T	0129	FW	F	DV	ML	90	--	3000	ØD	GR	0	01121	0	0	061.6	RØMANS	1	2001.1
2245.3	T	0129	FW	F	DV	HL	90	--	3000	ØD	GR	1	02383	1	0	052.3	RØMANS	1	2001.2
3245.3	T	0129	FW	F	DV	LH	90	--	3000	ØD	GR	3	05948	3	0	035.2	RØMANS	A	2001.3
4245.3	T	0129	FW	F	DV	MH	90	--	3000	ØD	GR	1	01077	0	0	062.5	RØMANS	A	2001.4
5245.3	T	0129	FW	F	DV	HH	90	--	3000	ØD	GR	3	01079	0	0	063.1	RØMANS	A	2001.5
6245.3	T	0129	FW	F	DV	LL	90	--	3000	ØD	GR	9	06643	5	0	032.4	RØMANS	A	2001.6
1241.6	U	0129	FW	F	DV	ML	90	--	3000	ØD	GR	0	01458	0	0	059.0	SEARS	1	2002.1
2241.6	U	0129	FW	F	DV	HL	90	--	3000	ØD	GR	1	02800	1	0	050.6	SEARS	1	2002.2
3241.6	U	0129	FW	F	DV	LH	90	--	3000	ØD	GR	3	03664	3	0	046.9	SEARS	1	2002.3
4241.6	U	0129	FW	F	DV	MH	90	--	3000	ØD	GR	1	01577	0	1	058.1	SEARS	1	2002.4
5241.6	U	0129	FW	F	DV	HH	90	--	3000	ØD	GR	3	02670	0	2	052.1	SEARS	1	2002.5
6241.6	U	0129	FW	F	DV	LL	90	--	3000	ØD	GR	9	05699	0	1	036.7	SEARS	1	2002.6
1246.4	T	0129	FW	F	NF	ML	90	--	3000	ØD	GR	0	01075	0	0	061.8	RØMANS	4	2003.1
2246.4	T	0129	FW	F	NF	HL	90	--	3000	ØD	GR	1	03617	0	3	045.1	RØMANS	4	2003.2
3246.4	T	0129	FW	F	NF	LH	90	--	3000	ØD	GR	3	08833	0	3	020.5	RØMANS	4	2003.3
4246.4	T	0129	FW	F	NF	MH	90	--	3000	ØD	GR	1	06374	0	3	032.3	RØMANS	4	2003.4
5246.4	T	0129	FW	F	NF	HH	90	--	3000	ØD	GR	3	01903	0	2	054.8	RØMANS	1	2003.5
6246.4	T	0129	FW	F	NF	LL	90	--	3000	ØD	GR	9	03144	8	0	045.6	RØMANS	1	2003.6
1242.4	U	0129	FW	F	NF	ML	90	--	3000	ØD	GR	0	05279	0	1	038.5	RØMANS	1	2004.1
2242.4	U	0129	FW	F	NF	HL	90	--	3000	ØD	GR	1	01846	0	0	055.9	RØMANS	A	2004.2
3242.4	U	0129	FW	F	NF	LH	90	--	3000	ØD	GR	3	03650	3	0	047.0	RØMANS	1	2004.3
4242.4	U	0129	FW	F	NF	MH	90	--	3000	ØD	GR	1	01198	0	0	061.3	RØMANS	1	2004.4
5242.4	U	0129	FW	F	NF	HH	90	--	3000	ØD	GR	3	02703	0	1	052.0	RØMANS	1	2004.5
6242.4	U	0129	FW	F	NF	LL	90	--	3000	ØD	GR	9	04922	7	0	040.6	RØMANS	1	2004.6
1247.4	T	0129	FW	F	WF	ML	90	--	3000	ØD	GR	0	04558	0	4	041.4	SEARS	4	2005.1
2247.4	T	0129	FW	F	WF	HL	90	--	3000	ØD	GR	1	01917	0	0	054.2	SEARS	4	2005.2
3247.4	T	0129	FW	F	WF	LH	90	--	3000	ØD	GR	3	03135	3	0	048.5	SEARS	4	2005.3
4247.4	T	0129	FW	F	WF	MH	90	--	3000	ØD	GR	1	01619	0	0	056.4	SEARS	4	2005.4
5247.4	T	0129	FW	F	WF	HH	90	--	3000	ØD	GR	3	02322	0	1	052.6	SEARS	4	2005.5
6247.4	T	0129	FW	F	WF	LL	90	--	3000	ØD	GR	9	04745	9	0	040.5	SEARS	4	2005.6
1243.3	U	0129	FW	F	WF	ML	90	--	3000	ØD	GR	0	01601	0	0	057.6	SEARS	4	2006.1
2243.3	U	0129	FW	F	WF	HL	90	--	3000	ØD	GR	1	02791	1	0	050.4	SEARS	4	2006.2
3243.3	U	0129	FW	F	WF	LH	90	--	3000	ØD	GR	3	05688	3	0	036.6	SEARS	4	2006.3
4243.3	U	0129	FW	F	WF	MH	90	--	3000	ØD	GR	1	02273	1	0	053.7	SEARS	4	2006.4
5243.3	U	0129	FW	F	WF	HH	90	--	3000	ØD	GR	3	02534	0	2	052.6	SEARS	4	2006.5
6243.3	U	0129	FW	F	WF	LL	90	--	3000	ØD	GR	9	05673	9	0	036.6	SEARS	4	2006.6
1248.3	T	0129	FW	F	VF	ML	90	--	3000	ØD	GR	0	04333	0	1	042.3	RØMANS	1	2007.1
2248.3	T	0129	FW	F	VF	HL	90	--	3000	ØD	GR	1	01861	0	0	054.7	RØMANS	4	2007.2
3248.3	T	0129	FW	F	VF	LH	90	--	3000	ØD	GR	3	03675	0	2	045.7	RØMANS	5	2007.3
4248.3	T	0129	FW	F	VF	MH	90	--	3000	ØD	GR	1	02203	0	1	053.3	RØMANS	1	2007.4
5248.3	T	0129	FW	F	VF	HH	90	--	3000	ØD	GR	3	04367	0	1	042.3	RØMANS	2	2007.5
6248.3	T	0129	FW	F	VF	LL	90	--	3000	ØD	GR	9	02769	0	1	050.4	RØMANS	4	2007.6
1244.3	U	0129	FW	F	VF	ML	90	--	3000	ØD	GR	0	02752	0	1	050.9	SEARS	4	2008.1
2244.3	U	0129	FW	F	VF	HL	90	--	3000	ØD	GR	1	02216	1	0	053.4	SEARS	4	2008.2
3244.3	U	0129	FW	F	VF	LH	90	--	3000	ØD	GR	3	08401	3	1	023.0	SEARS	4	2008.3
4244.3	U	0129	FW	F	VF	MH	90	--	3000	ØD	GR	1	04754	0	1	040.8	SEARS	4	2008.4
5244.3	U	0129	FW	F	VF	HH	90	--	3000	ØD	GR	3	03461	0	1	047.3	SEARS	4	2008.5
6244.3	U	0129	FW	F	VF	LL	90	--	3000	ØD	GR	9	02547	0	2	051.9	SEARS	4	2008.6
1253.3	T	0130	FW	F	DV	ML	90	--	3000	ØD	GR	9	04550	7	0	042.3	RØMANS	1	2009.1
2253.3	T	0130	FW	F	DV	HL	90	--	3000	ØD	GR	3	02395	3	0	053.1	RØMANS	1	2009.2
3253.3	T	0130	FW	F	DV	LH	90	--	3000	ØD	GR	1	02080	0	0	055.7	RØMANS	1	2009.3

4253.3	T	0130	FW	F	DV	MH	90	--	3000	ØD	GR	0	01073	0	0	063.8	RØMANS	1	2009.4
5253.3	T	0130	FW	F	DV	HH	90	--	3000	ØD	GR	3	01071	0	0	064.0	RØMANS	1	2009.5
6253.3	T	0130	FW	F	DV	LL	90	--	3000	ØD	GR	9	03307	3	0	048.5	RØMANS	1	2009.6
1249.3	U	0130	FW	F	DV	ML	90	--	3000	ØD	GR	9	08595	0	2	022.3	SEARS	1	2010.1
2249.3	U	0130	FW	F	DV	HL	90	--	3000	ØD	GR	3	02600	3	0	052.3	SEARS	1	2010.2
3249.3	U	0130	FW	F	DV	LH	90	--	3000	ØD	GR	1	09044	0	5	020.8	SEARS	1	2010.3
4249.3	U	0130	FW	F	DV	MH	90	--	3000	ØD	GR	0	01531	0	0	058.5	SEARS	1	2010.4
5249.3	U	0130	FW	F	DV	HH	90	--	3000	ØD	GR	1	01509	0	0	058.9	SEARS	1	2010.5
6249.3	U	0130	FW	F	DV	LL	90	--	3000	ØD	GR	3	01956	0	0	056.2	SEARS	1	2010.6
1254.0	T	0130	FW	F	NF	ML	90	--	3000	ØD	GR	9	03274	9	0	048.1	RØMANS	1	2011.1
2254.0	T	0130	FW	F	NF	HL	90	--	3000	ØD	GR	3	02888	0	1	049.3	RØMANS	4	2011.2
3254.0	T	0130	FW	F	NF	LH	90	--	3000	ØD	GR	1	03435	0	3	047.4	RØMANS	7	2011.3
4254.0	T	0130	FW	F	NF	MH	90	--	3000	ØD	GR	0	05880	0	2	035.3	RØMANS	7	2011.4
5254.0	T	0130	FW	F	NF	HH	90	--	3000	ØD	GR	1	01077	0	0	062.6	RØMANS	4	2011.5
6254.0	T	0130	FW	F	NF	LL	90	--	3000	ØD	GR	3	07361	3	0	028.1	RØMANS	4	2011.6
1250.3	U	0130	FW	F	NF	ML	90	--	3000	ØD	GR	9	01855	0	0	056.2	SEARS	4	2012.1
2250.3	U	0130	FW	F	NF	HL	90	--	3000	ØD	GR	3	02570	3	0	051.6	SEARS	4	2012.2
3250.3	U	0130	FW	F	NF	LH	90	--	3000	ØD	GR	1	02511	0	0	052.5	SEARS	4	2012.3
4250.3	U	0130	FW	F	NF	MH	90	--	3000	ØD	GR	0	01437	0	0	058.5	SEARS	4	2012.4
5250.3	U	0130	FW	F	NF	HH	90	--	3000	ØD	GR	1	01466	0	0	058.4	SEARS	4	2012.5
6250.3	U	0130	FW	F	NF	LL	90	--	3000	ØD	GR	3	02693	3	0	051.5	SEARS	4	2012.6
1255.3	T	0130	FW	F	WF	ML	90	--	3000	ØD	GR	9	04415	0	3	042.1	SEARS	4	2013.1
2255.3	T	0130	FW	F	WF	HL	90	--	3000	ØD	GR	3	02714	0	1	050.0	SEARS	4	2013.2
3255.3	T	0130	FW	F	WF	LH	90	--	3000	ØD	GR	1	02481	0	0	051.7	SEARS	4	2013.3
4255.3	T	0130	FW	F	WF	MH	90	--	3000	ØD	GR	0	02791	0	1	049.9	SEARS	4	2013.4
5255.3	T	0130	FW	F	WF	HH	90	--	3000	ØD	GR	1	02802	0	2	049.9	SEARS	4	2013.5
6255.3	T	0130	FW	F	WF	LL	90	--	3000	ØD	GR	3	05481	3	0	036.6	SEARS	4	2013.6
1251.4	U	0130	FW	F	WF	ML	90	--	3000	ØD	GR	9	07451	3	0	027.4	RØMANS	1	2014.1
2251.4	U	0130	FW	F	WF	HL	90	--	3000	ØD	GR	3	05016	0	1	038.9	RØMANS	1	2014.2
3251.4	U	0130	FW	F	WF	LH	90	--	3000	ØD	GR	1	02099	0	0	055.0	RØMANS	1	2014.3
4251.4	U	0130	FW	F	WF	MH	90	--	3000	ØD	GR	0	05426	0	1	037.3	RØMANS	1	2014.4
5251.4	U	0130	FW	F	WF	HH	90	--	3000	ØD	GR	1	01934	0	1	055.1	RØMANS	1	2014.5
6251.4	U	0130	FW	F	WF	LL	90	--	3000	ØD	GR	3	05376	3	0	037.3	RØMANS	1	2014.6
1256.3	T	0130	FW	F	VF	ML	90	--	3000	ØD	GR	9	07506	0	1	026.5	RØMANS	4	2015.1
2256.3	T	0130	FW	F	VF	HL	90	--	3000	ØD	GR	3	07810	1	0	024.7	RØMANS	5	2015.2
3256.3	T	0130	FW	F	VF	LH	90	--	3000	ØD	GR	1	10000	0	6	014.8	RØMANS	4	2015.3
4256.3	T	0130	FW	F	VF	MH	90	--	3000	ØD	GR	0	05493	0	1	036.4	RØMANS	4	2015.4
5256.3	T	0130	FW	F	VF	HH	90	--	3000	ØD	GR	1	09765	0	2	016.1	RØMANS	4	2015.5
6256.3	T	0130	FW	F	VF	LL	90	--	3000	ØD	GR	3	07888	0	2	025.6	RØMANS	4	2015.6
1252.5	U	0130	FW	F	VF	ML	90	--	3000	ØD	GR	9	04474	9	0	042.0	SEARS	4	2016.1
2252.5	U	0130	FW	F	VF	HL	90	--	3000	ØD	GR	3	06654	0	2	030.6	SEARS	4	2016.2
3252.5	U	0130	FW	F	VF	LH	90	--	3000	ØD	GR	1	04164	1	0	043.7	SEARS	4	2016.3
4252.5	U	0130	FW	F	VF	MH	90	--	3000	ØD	GR	0	08361	0	5	023.0	SEARS	4	2016.4
5252.5	U	0130	FW	F	VF	HH	90	--	3000	ØD	GR	1	06684	0	2	031.2	SEARS	4	2016.5
6252.5	U	0130	FW	F	VF	LL	90	--	3000	ØD	GR	3	04887	0	8	040.1	SEARS	4	2016.6
1262.4	T	0131	FW	F	DV	ML	90	--	3000	ØD	GR	3	08577	0	1	022.0	RØMANS	1	2017.1
2262.4	T	0131	FW	F	DV	HL	90	--	3000	ØD	GR	1	02654	1	0	051.5	RØMANS	1	2017.2
3262.4	T	0131	FW	F	DV	LH	90	--	3000	ØD	GR	3	10847	3	0	011.2	RØMANS	1	2017.3
4262.4	T	0131	FW	F	DV	MH	90	--	3000	ØD	GR	9	07341	4	0	028.1	RØMANS	1	2017.4
5262.4	T	0131	FW	F	DV	HH	90	--	3000	ØD	GR	0	01075	0	0	062.6	RØMANS	1	2017.5
6262.4	T	0131	FW	F	DV	LL	90	--	3000	ØD	GR	1	04774	1	0	040.6	RØMANS	1	2017.6
1257.3	U	0131	FW	F	DV	ML	90	--	3000	ØD	GR	3	02310	3	0	053.6	SEARS	4	2018.1
2257.3	U	0131	FW	F	DV	HL	90	--	3000	ØD	GR	1	02404	1	0	052.6	SEARS	4	2018.2

3257.3	U	0131	FW	F	DV	LH	90	--	3000	ØD	GR	3	02859	0	2	051.1	SEARS	A	2018.3
4257.3	U	0131	FW	F	DV	MH	90	--	3000	ØD	GR	9	01584	0	0	058.1	SEARS	A	2018.4
5257.3	U	0131	FW	F	DV	HH	90	--	3000	ØD	GR	0	01535	0	0	058.6	SEARS	A	2018.5
6257.3	U	0131	FW	F	DV	LL	90	--	3000	ØD	GR	1	01965	0	0	056.2	SEARS	A	2018.6
1263.4	T	0131	FW	F	NF	ML	90	--	3000	ØD	GR	3	06962	3	0	029.9	SEARS	6	2019.1
2263.4	T	0131	FW	F	NF	HL	90	--	3000	ØD	GR	1	02593	1	0	051.2	SEARS	4	2019.2
3263.4	T	0131	FW	F	NF	LH	90	--	3000	ØD	GR	3	06805	3	0	030.9	SEARS	4	2019.3
4263.4	T	0131	FW	F	NF	MH	90	--	3000	ØD	GR	9	03232	3	0	048.4	SEARS	6	2019.4
5263.4	T	0131	FW	F	NF	HH	90	--	3000	ØD	GR	0	01573	0	0	057.5	SEARS	4	2019.5
6263.4	T	0131	FW	F	NF	LL	90	--	3000	ØD	GR	1	03655	1	0	046.3	SEARS	4	2019.6
1258.3	U	0131	FW	F	NF	ML	90	--	3000	ØD	GR	3	04012	3	0	044.8	RØMANS	1	2020.1
2258.3	U	0131	FW	F	NF	HL	90	--	3000	ØD	GR	1	01932	0	0	054.7	RØMANS	4	2020.2
3258.3	U	0131	FW	F	NF	LH	90	--	3000	ØD	GR	3	04137	3	0	043.4	RØMANS	5	2020.3
4258.3	U	0131	FW	F	NF	MH	90	--	3000	ØD	GR	9	03802	6	0	045.5	RØMANS	1	2020.4
5258.3	U	0131	FW	F	NF	HH	90	--	3000	ØD	GR	0	01104	0	0	061.9	RØMANS	7	2020.5
6258.3	U	0131	FW	F	NF	LL	90	--	3000	ØD	GR	1	02816	1	0	050.3	RØMANS	4	2020.6
1264.4	T	0131	FW	F	WF	ML	90	--	3000	ØD	GR	3	05116	3	0	038.9	RØMANS	5	2021.1
2264.4	T	0131	FW	F	WF	HL	90	--	3000	ØD	GR	1	01963	0	0	054.1	RØMANS	4	2021.2
3264.4	T	0131	FW	F	WF	LH	90	--	3000	ØD	GR	3	04431	3	0	042.2	RØMANS	4	2021.3
4264.4	T	0131	FW	F	WF	MH	90	--	3000	ØD	GR	9	03712	3	0	045.7	RØMANS	4	2021.4
5264.4	T	0131	FW	F	WF	HH	90	--	3000	ØD	GR	0	01143	0	0	060.9	RØMANS	4	2021.5
6264.4	T	0131	FW	F	WF	LL	90	--	3000	ØD	GR	1	04413	1	0	042.5	RØMANS	1	2021.6
1259.3	U	0131	FW	F	WF	ML	90	--	3000	ØD	GR	3	01152	0	0	061.0	RØMANS	7	2022.1
2259.3	U	0131	FW	F	WF	HL	90	--	3000	ØD	GR	1	10421	0	0	012.3	RØMANS	A	2022.2
3259.3	U	0131	FW	F	WF	LH	90	--	3000	ØD	GR	3	07692	3	0	025.8	RØMANS	3	2022.3
4259.3	U	0131	FW	F	WF	MH	90	--	3000	ØD	GR	9	03635	2	2	046.5	RØMANS	1	2022.4
5259.3	U	0131	FW	F	WF	HH	90	--	3000	ØD	GR	0	01077	0	0	063.3	RØMANS	5	2022.5
6259.3	U	0131	FW	F	WF	LL	90	--	3000	ØD	GR	1	04162	0	2	044.8	RØMANS	3	2022.6
1261.3	T	0131	FW	F	VF	ML	90	--	3000	ØD	GR	3	03432	0	4	046.7	SEARS	6	2023.1
2261.3	T	0131	FW	F	VF	HL	90	--	3000	ØD	GR	1	01928	0	0	054.2	SEARS	6	2023.2
3261.3	T	0131	FW	F	VF	LH	90	--	3000	ØD	GR	3	04880	3	0	039.8	SEARS	6	2023.3
4261.3	T	0131	FW	F	VF	MH	90	--	3000	ØD	GR	9	04609	4	0	039.8	SEARS	6	2023.4
5261.3	T	0131	FW	F	VF	HH	90	--	3000	ØD	GR	0	01355	0	0	058.9	SEARS	6	2023.5
6261.3	T	0131	FW	F	VF	LL	90	--	3000	ØD	GR	1	02439	0	2	052.6	SEARS	6	2023.6
1260.3	U	0131	FW	F	VF	ML	90	--	3000	ØD	GR	3	06072	3	0	034.4	SEARS	4	2024.1
2260.3	U	0131	FW	F	VF	HL	90	--	3000	ØD	GR	1	02170	0	0	053.6	SEARS	4	2024.2
3260.3	U	0131	FW	F	VF	LH	90	--	3000	ØD	GR	3	03049	0	3	049.6	SEARS	4	2024.3
4260.3	U	0131	FW	F	VF	MH	90	--	3000	ØD	GR	9	03847	0	5	045.4	SEARS	4	2024.4
5260.3	U	0131	FW	F	VF	HH	90	--	3000	ØD	GR	0	01916	0	1	055.5	SEARS	4	2024.5
6260.3	U	0131	FW	F	VF	LL	90	--	3000	ØD	GR	1	02383	0	3	053.1	SEARS	4	2024.6
1269.3	T	0203	FW	F	DV	ML	90	--	3000	ØD	GR	1	09655	0	3	016.8	SEARS	1	2025.1
2269.3	T	0203	FW	F	DV	HL	90	--	3000	ØD	GR	3	07903	0	2	024.9	SEARS	1	2025.2
3269.3	T	0203	FW	F	DV	LH	90	--	3000	ØD	GR	1	07063	1	2	029.5	SEARS	1	2025.3
4269.3	T	0203	FW	F	DV	MH	90	--	3000	ØD	GR	3	01588	0	0	056.9	SEARS	1	2025.4
5269.3	T	0203	FW	F	DV	HH	90	--	3000	ØD	GR	9	06332	3	0	032.9	SEARS	1	2025.5
6269.3	T	0203	FW	F	DV	LL	90	--	3000	ØD	GR	0	01899	0	0	055.5	SEARS	1	2025.6
1265.3	U	0203	FW	F	DV	ML	90	--	3000	ØD	GR	1	02058	0	2	055.4	SEARS	1	2026.1
2265.3	U	0203	FW	F	DV	HL	90	--	3000	ØD	GR	3	06519	0	1	031.8	SEARS	1	2026.2
3265.3	U	0203	FW	F	DV	LH	90	--	3000	ØD	GR	1	06078	0	3	035.0	SEARS	1	2026.3
4265.3	U	0203	FW	F	DV	MH	90	--	3000	ØD	GR	3	07026	0	1	030.0	SEARS	1	2026.4
5265.3	U	0203	FW	F	DV	HH	90	--	3000	ØD	GR	9	03952	0	2	046.0	SEARS	1	2026.5
6265.3	U	0203	FW	F	DV	LL	90	--	3000	ØD	GR	0	05867	0	1	035.9	SEARS	1	2026.6
1270.4	T	0203	FW	F	NF	ML	90	--	3000	ØD	GR	1	07845	1	0	025.4	RØMANS	5	2027.1

2270.4	T	0203	FW	F	NF	HL	90	--	3000	ØD	GR	3	02703	0	1	050.6	RØMANS	1	2027.2
3270.4	T	0203	FW	F	NF	LH	90	--	3000	ØD	GR	1	02047	0	0	055.2	RØMANS	5	2027.3
4270.4	T	0203	FW	F	NF	MH	90	--	3000	ØD	GR	3	01316	0	0	058.1	RØMANS	7	2027.4
5270.4	T	0203	FW	F	NF	HH	90	--	3000	ØD	GR	9	02879	0	0	049.6	RØMANS	A	2027.5
6270.4	T	0203	FW	F	NF	LL	90	--	3000	ØD	GR	0	01663	0	0	057.8	RØMANS	7	2027.6
1266.3	U	0203	FW	F	NF	ML	90	--	3000	ØD	GR	1	02047	0	1	055.6	RØMANS	1	2028.1
2266.3	U	0203	FW	F	NF	HL	90	--	3000	ØD	GR	3	02829	3	0	050.6	RØMANS	1	2028.2
3266.3	U	0203	FW	F	NF	LH	90	--	3000	ØD	GR	1	02058	0	1	056.2	RØMANS	1	2028.3
4266.3	U	0203	FW	F	NF	MH	90	--	3000	ØD	GR	3	01075	0	0	063.6	RØMANS	1	2028.4
5266.3	U	0203	FW	F	NF	HH	90	--	3000	ØD	GR	9	01073	0	0	063.3	RØMANS	1	2028.5
6266.3	U	0203	FW	F	NF	LL	90	--	3000	ØD	GR	0	01694	0	0	057.5	RØMANS	1	2028.6
1271.4	T	0203	FW	F	WF	ML	90	--	3000	ØD	GR	1	03172	1	0	049.2	SEARS	4	2029.1
2271.4	T	0203	FW	F	WF	HL	90	--	3000	ØD	GR	3	02853	3	0	050.2	SEARS	4	2029.2
3271.4	T	0203	FW	F	WF	LH	90	--	3000	ØD	GR	1	02388	0	0	053.6	SEARS	4	2029.3
4271.4	T	0203	FW	F	WF	MH	90	--	3000	ØD	GR	3	01491	0	0	058.8	SEARS	4	2029.4
5271.4	T	0203	FW	F	WF	HH	90	--	3000	ØD	GR	9	01540	0	0	058.9	SEARS	4	2029.5
6271.4	T	0203	FW	F	WF	LL	90	--	3000	ØD	GR	0	01974	0	0	056.7	SEARS	4	2029.6
1267.3	U	0203	FW	F	WF	ML	90	--	3000	ØD	GR	1	04182	0	3	043.8	SEARS	5	2030.1
2267.3	U	0203	FW	F	WF	HL	90	--	3000	ØD	GR	3	05576	0	1	036.6	SEARS	1	2030.2
3267.3	U	0203	FW	F	WF	LH	90	--	3000	ØD	GR	1	02529	0	0	052.9	SEARS	1	2030.3
4267.3	U	0203	FW	F	WF	MH	90	--	3000	ØD	GR	3	01337	0	0	059.3	SEARS	1	2030.4
5267.3	U	0203	FW	F	WF	HH	90	--	3000	ØD	GR	9	01310	0	0	059.9	SEARS	1	2030.5
6267.3	U	0203	FW	F	WF	LL	90	--	3000	ØD	GR	0	01982	0	0	055.7	SEARS	1	2030.6
1272.4	T	0203	FW	F	VF	ML	90	--	3000	ØD	GR	1	01092	0	0	062.6	RØMANS	4	2031.1
2272.4	T	0203	FW	F	VF	HL	90	--	3000	ØD	GR	3	02813	3	0	050.2	RØMANS	1	2031.2
3272.4	T	0203	FW	F	VF	LH	90	--	3000	ØD	GR	1	04226	0	2	044.2	RØMANS	4	2031.3
4272.4	T	0203	FW	F	VF	MH	90	--	3000	ØD	GR	3	01085	0	0	062.2	RØMANS	4	2031.4
5272.4	T	0203	FW	F	VF	HH	90	--	3000	ØD	GR	9	06250	0	1	038.3	RØMANS	4	2031.5
6272.4	T	0203	FW	F	VF	LL	90	--	3000	ØD	GR	0	01896	0	0	055.5	RØMANS	D	2031.6
1268.3	U	0203	FW	F	VF	ML	90	--	3000	ØD	GR	1	01093	0	0	062.2	RØMANS	7	2032.1
2268.3	U	0203	FW	F	VF	HL	90	--	3000	ØD	GR	3	02727	3	0	050.5	RØMANS	7	2032.2
3268.3	U	0203	FW	F	VF	LH	90	--	3000	ØD	GR	1	02051	0	0	055.6	RØMANS	7	2032.3
4268.3	U	0203	FW	F	VF	MH	90	--	3000	ØD	GR	3	01070	0	0	062.7	RØMANS	7	2032.4
5268.3	U	0203	FW	F	VF	HH	90	--	3000	ØD	GR	9	01121	0	0	061.7	RØMANS	1	2032.5
6268.3	U	0203	FW	F	VF	LL	90	--	3000	ØD	GR	0	01809	0	0	056.5	RØMANS	7	2032.6

****** DATA FRØM SEEKVAL EXPERIMENT 3 ******

4225.4	T	0127	FW	F	DV	ML	40	45	3000	ØD	GR	3	07367	3	0	028.5	RØMANS	A	3001.1
5225.4	T	0127	FW	F	DV	HL	40	45	3000	ØD	GR	3	05786	3	0	035.6	RØMANS	A	3001.2
6225.4	T	0127	FW	F	DV	LH	40	45	3000	ØD	GR	3	04177	3	0	044.7	RØMANS	A	3001.3
1225.4	T	0127	FW	F	DV	MH	40	45	3000	ØD	GR	3	01068	0	0	064.4	RØMANS	A	3001.4
2225.4	T	0127	FW	F	DV	HH	40	45	3000	ØD	GR	3	04019	0	1	045.2	RØMANS	A	3001.5
3225.4	T	0127	FW	F	DV	LL	40	45	3000	ØD	GR	3	07556	3	0	027.6	RØMANS	A	3001.6
4229.4	U	0127	FW	F	DV	ML	40	45	3000	ØD	GR	3	05925	3	0	035.2	SEARS	A	3002.1
5229.4	U	0127	FW	F	DV	HL	40	45	3000	ØD	GR	3	06237	3	0	033.1	SEARS	A	3002.2
6229.4	U	0127	FW	F	DV	LH	40	45	3000	ØD	GR	3	02195	0	0	028.4	SEARS	A	3002.3
1229.4	U	0127	FW	F	DV	MH	40	45	3000	ØD	GR	3	01449	0	0	057.5	SEARS	A	3002.4
2229.4	U	0127	FW	F	DV	HH	40	45	3000	ØD	GR	3	02954	0	1	049.2	SEARS	A	3002.5
3229.4	U	0127	FW	F	DV	LL	40	45	3000	ØD	GR	3	04809	3	0	040.6	SEARS	A	3002.6
4226.3	T	0127	FW	F	NF	ML	40	45	3000	ØD	GR	3	05570	3	0	037.0	RØMANS	E	3003.1
5226.3	T	0127	FW	F	NF	HL	40	45	3000	ØD	GR	3	05732	3	0	035.5	RØMANS	A	3003.2
6226.3	T	0127	FW	F	NF	LH	40	45	3000	ØD	GR	3	07361	3	0	028.4	RØMANS	E	3003.3
1226.3	T	0127	FW	F	NF	MH	40	45	3000	ØD	GR	3	01075	0	0	062.9	RØMANS	E	3003.4
2226.3	T	0127	FW	F	NF	HH	40	45	3000	ØD	GR	3	01855	0	1	056.0	RØMANS	E	3003.5
3226.3	T	0127	FW	F	NF	LL	40	45	3000	ØD	GR	3	05252	3	0	038.5	RØMANS	A	3003.6
4230.3	U	0127	FW	F	NF	ML	40	45	3000	ØD	GR	3	06057	3	0	034.5	SEARS	A	3004.1
5230.3	U	0127	FW	F	NF	HL	40	45	3000	ØD	GR	3	05208	3	0	038.0	SEARS	A	3004.2
6230.3	U	0127	FW	F	NF	LH	40	45	3000	ØD	GR	3	02254	0	1	054.7	SEARS	A	3004.3
1230.3	U	0127	FW	F	NF	MH	40	45	3000	ØD	GR	3	05384	0	1	036.7	SEARS	E	3004.4
2230.3	U	0127	FW	F	NF	HH	40	45	3000	ØD	GR	3	01819	0	0	055.4	SEARS	E	3004.5
3230.3	U	0127	FW	F	NF	LL	40	45	3000	ØD	GR	3	02042	0	0	054.0	SEARS	E	3004.6
4227.3	T	0127	FW	F	WF	ML	40	45	3000	ØD	GR	3	05955	3	0	035.2	RØMANS	A	3005.1
5227.3	T	0127	FW	F	WF	HL	40	45	3000	ØD	GR	3	05440	3	0	037.0	RØMANS	A	3005.2
6227.3	T	0127	FW	F	WF	LH	40	45	3000	ØD	GR	3	02058	0	2	055.5	RØMANS	A	3005.3
1227.3	T	0127	FW	F	WF	MH	40	45	3000	ØD	GR	3	02492	0	2	053.3	RØMANS	E	3005.4
2227.3	T	0127	FW	F	WF	HH	40	45	3000	ØD	GR	3	01085	0	0	063.4	RØMANS	E	3005.5
3227.3	T	0127	FW	F	WF	LL	40	45	3000	ØD	GR	3	06636	3	0	032.4	RØMANS	E	3005.6
4231.4	U	0127	FW	F	WF	ML	40	45	3000	ØD	GR	3	06145	0	2	034.3	SEARS	E	3006.1
5231.4	U	0127	FW	F	WF	HL	40	45	3000	ØD	GR	3	07905	3	0	028.9	SEARS	E	3006.2
6231.4	U	0127	FW	F	WF	LH	40	45	3000	ØD	GR	3	03810	3	0	046.2	SEARS	E	3006.3
1231.4	U	0127	FW	F	WF	MH	40	45	3000	ØD	GR	3	01782	3	0	055.7	SEARS	E	3006.4
2231.4	U	0127	FW	F	WF	HH	40	45	3000	ØD	GR	3	01377	0	0	058.6	SEARS	E	3006.5
3231.4	U	0127	FW	F	WF	LL	40	45	3000	ØD	GR	3	04448	0	2	042.1	SEARS	E	3006.6
4228.3	T	0127	FW	F	VF	ML	40	45	3000	ØD	GR	3	02727	0	3	051.4	RØMANS	E	3007.1
5228.3	T	0127	FW	F	VF	HL	40	45	3000	ØD	GR	3	03388	0	1	047.4	RØMANS	F	3007.2
6228.3	T	0127	FW	F	VF	LH	40	45	3000	ØD	GR	3	03553	0	3	047.3	RØMANS	E	3007.3
1228.3	T	0127	FW	F	VF	MH	40	45	3000	ØD	GR	3	06089	0	3	034.7	RØMANS	F	3007.4
2228.3	T	0127	FW	F	VF	HH	40	45	3000	ØD	GR	3	04285	0	1	044.3	RØMANS	E	3007.5
3228.3	T	0127	FW	F	VF	LL	40	45	3000	ØD	GR	3	06120	0	1	034.5	RØMANS	E	3007.6
4232.4	U	0127	FW	F	VF	ML	40	45	3000	ØD	GR	3	05753	3	0	036.0	SEARS	A	3008.1
5232.4	U	0127	FW	F	VF	HL	40	45	3000	ØD	GR	3	05060	3	0	038.7	SEARS	A	3008.2
6232.4	U	0127	FW	F	VF	LH	40	45	3000	ØD	GR	3	04347	3	0	043.2	SEARS	F	3008.3
1232.4	U	0127	FW	F	VF	MH	40	45	3000	ØD	GR	3	01884	0	0	055.0	SEARS	F	3008.4
2232.4	U	0127	FW	F	VF	HH	40	45	3000	ØD	GR	3	01919	0	0	055.8	SEARS	F	3008.5
3232.4	U	0127	FW	F	VF	LL	40	45	3000	ØD	GR	3	05376	0	3	037.2	SEARS	E	3008.6
1237.3	T	0128	FW	F	DV	ML	40	0	3000	ØD	GR	3	06160	3	0	033.5	SEARS	1	3009.1
2237.3	T	0128	FW	F	DV	HL	40	0	3000	ØD	GR	3	05493	3	0	036.2	SEARS	1	3009.2
3237.3	T	0128	FW	F	DV	LH	40	0	3000	ØD	GR	3	06997	3	0	029.7	SEARS	1	3009.3

4237.3	T	0128	FW	F	DV	MH	40	0	3000	ØD	GR	3	02525	0	6	051.7	SEARS	1	3009.4
5237.3	T	0128	FW	F	DV	HH	40	0	3000	ØD	GR	3	01937	0	0	055.1	SEARS	1	3009.5
6237.3	T	0128	FW	F	DV	LL	40	0	3000	ØD	GR	3	06131	0	1	034.2	SEARS	1	3009.6
1233.3	U	0128	FW	F	DV	ML	40	0	3000	ØD	GR	3	04779	3	0	040.4	RØMANS	A	3010.1
2233.3	U	0128	FW	F	DV	HL	40	0	3000	ØD	GR	3	01837	0	0	055.0	RØMANS	A	3010.2
3233.3	U	0128	FW	F	DV	LH	40	0	3000	ØD	GR	3	04911	3	0	039.9	RØMANS	A	3010.3
4233.3	U	0128	FW	F	DV	MH	40	0	3000	ØD	GR	3	03759	3	0	045.5	RØMANS	A	3010.4
5233.3	U	0128	FW	F	DV	HH	40	0	3000	ØD	GR	3	02469	0	2	052.2	RØMANS	A	3010.5
6233.3	U	0128	FW	F	DV	LL	40	0	3000	ØD	GR	3	04477	3	0	042.1	RØMANS	A	3010.6
1238.3	T	0128	FW	F	NF	ML	40	0	3000	ØD	GR	3	06997	3	0	029.6	SEARS	4	3011.1
2238.3	T	0128	FW	F	NF	HL	40	0	3000	ØD	GR	3	05937	0	2	034.1	SEARS	6	3011.2
3238.3	T	0128	FW	F	NF	LH	40	0	3000	ØD	GR	3	09309	0	3	018.5	SEARS	6	3011.3
4238.3	T	0128	FW	F	NF	MH	40	0	3000	ØD	GR	3	01721	0	0	056.2	SEARS	6	3011.4
5238.3	T	0128	FW	F	NF	HH	40	0	3000	ØD	GR	3	04739	0	1	040.6	SEARS	6	3011.5
6238.3	T	0128	FW	F	NF	LL	40	0	3000	ØD	GR	3	02366	0	1	053.3	SEARS	6	3011.6
1234.3	U	0128	FW	F	NF	ML	40	0	3000	ØD	GR	3	05847	3	0	034.9	RØMANS	E	3012.1
2234.3	U	0128	FW	F	NF	HL	40	0	3000	ØD	GR	3	05927	3	0	033.8	RØMANS	A	3012.2
3234.3	U	0128	FW	F	NF	LH	40	0	3000	ØD	GR	3	06909	3	0	030.0	RØMANS	A	3012.3
4234.3	U	0128	FW	F	NF	MH	40	0	3000	ØD	GR	3	04547	0	1	041.2	RØMANS	A	3012.4
5234.3	U	0128	FW	F	NF	HH	40	0	3000	ØD	GR	3	02042	0	1	054.3	RØMANS	A	3012.5
6234.3	U	0128	FW	F	NF	LL	40	0	3000	ØD	GR	3	05208	3	0	038.4	RØMANS	A	3012.6
1239.4	T	0128	FW	F	WF	ML	40	0	3000	ØD	GR	3	05993	3	0	034.4	SEARS	4	3013.1
2239.4	T	0128	FW	F	WF	HL	40	0	3000	ØD	GR	3	07273	3	0	028.0	SEARS	4	3013.2
3239.4	T	0128	FW	F	WF	LH	40	0	3000	ØD	GR	3	04437	3	0	042.2	SEARS	4	3013.3
4239.4	T	0128	FW	F	WF	MH	40	0	3000	ØD	GR	3	02870	0	2	049.7	SEARS	4	3013.4
5239.4	T	0128	FW	F	WF	HH	40	0	3000	ØD	GR	3	01877	0	0	055.3	SEARS	4	3013.5
6239.4	T	0128	FW	F	WF	LL	40	0	3000	ØD	GR	3	05411	3	0	037.4	SEARS	4	3013.6
1235.4	U	0128	FW	F	WF	ML	40	0	3000	ØD	GR	3	07165	3	0	028.7	RØMANS	E	3014.1
2235.4	U	0128	FW	F	WF	HL	40	0	3000	ØD	GR	3	06305	3	0	032.2	RØMANS	A	3014.2
3235.4	U	0128	FW	F	WF	LH	40	0	3000	ØD	GR	3	07896	3	0	025.4	RØMANS	E	3014.3
4235.4	U	0128	FW	F	WF	MH	40	0	3000	ØD	GR	3	01180	0	0	060.2	RØMANS	C	3014.4
5235.4	U	0128	FW	F	WF	HH	40	0	3000	ØD	GR	3	03582	0	3	046.5	RØMANS	A	3014.5
6235.4	U	0128	FW	F	WF	LL	40	0	3000	ØD	GR	3	06083	3	0	034.1	RØMANS	E	3014.6
1240.3	T	0128	FW	F	VF	ML	40	0	3000	ØD	GR	3	05700	3	0	035.7	SEARS	6	3015.1
2240.3	T	0128	FW	F	VF	HL	40	0	3000	ØD	GR	3	03554	2	0	045.7	SEARS	6	3015.2
3240.3	T	0128	FW	F	VF	LH	40	0	3000	ØD	GR	3	02573	0	0	051.5	SEARS	6	3015.3
4240.3	T	0128	FW	F	VF	MH	40	0	3000	ØD	GR	3	01786	0	0	055.6	SEARS	4	3015.4
5240.3	T	0128	FW	F	VF	HH	40	0	3000	ØD	GR	3	01613	0	0	056.8	SEARS	6	3015.5
6240.3	T	0128	FW	F	VF	LL	40	0	3000	ØD	GR	3	05199	3	0	038.4	SEARS	6	3015.6
1236.3	U	0128	FW	F	VF	ML	40	0	3000	ØD	GR	3	04162	3	0	043.2	RØMANS	7	3016.1
2236.3	U	0128	FW	F	VF	HL	40	0	3000	ØD	GR	3	05195	3	0	037.4	RØMANS	5	3016.2
3236.3	U	0128	FW	F	VF	LH	40	0	3000	ØD	GR	3	02075	0	0	054.5	RØMANS	7	3016.3
4236.3	U	0128	FW	F	VF	MH	40	0	3000	ØD	GR	3	01158	0	0	059.9	RØMANS	7	3016.4
5236.3	U	0128	FW	F	VF	HH	40	0	3000	ØD	GR	3	01130	0	0	060.5	RØMANS	1	3016.5
6236.3	U	0128	FW	F	VF	LL	40	0	3000	ØD	GR	3	05559	3	0	036.5	RØMANS	1	3016.6
1219.3	T	0123	FW	F	DV	ML	20	45	3000	ØD	GR	3	07771	3	0	025.8	SEARS	1	3017.1
2219.3	T	0123	FW	F	DV	HL	20	45	3000	ØD	GR	3	05611	3	0	035.5	SEARS	1	3017.2
3219.3	T	0123	FW	F	DV	LH	20	45	3000	ØD	GR	3	02384	0	0	052.4	SEARS	1	3017.3
4219.3	T	0123	FW	F	DV	MH	20	45	3000	ØD	GR	3	01936	0	0	054.7	SEARS	A	3017.4
5219.3	T	0123	FW	F	DV	HH	20	45	3000	ØD	GR	3	01504	0	0	057.4	SEARS	A	3017.5
6219.3	T	0123	FW	F	DV	LL	20	45	3000	ØD	GR	3	06602	3	0	031.5	SEARS	A	3017.6
1217.3	U	0123	FW	F	DV	ML	20	45	3000	ØD	GR	3	09134	0	1	019.7	SEARS	1	3018.1
2217.3	U	0123	FW	F	DV	HL	20	45	3000	ØD	GR	3	01862	0	0	054.9	SEARS	1	3018.2

3217.3	U	0123	FW	F	DV	LH	20	45	3000	ØD	GR	3	02229	0	0	053.4	SEARS	1	3018.3
4217.3	U	0123	FW	F	DV	MH	20	45	3000	ØD	GR	3	04388	0	1	042.0	SEARS	A	3018.4
5217.3	U	0123	FW	F	DV	HH	20	45	3000	ØD	GR	3	01687	0	0	056.1	SEARS	A	3018.5
6217.3	U	0123	FW	F	DV	LL	20	45	3000	ØD	GR	3	07489	3	0	027.1	SEARS	A	3018.6
1220.3	T	0123	FW	F	NF	ML	20	45	3000	ØD	GR	3	06087	3	0	033.8	SEARS	4	3019.1
2220.3	T	0123	FW	F	NF	HL	20	45	3000	ØD	GR	3	06894	3	0	029.2	SEARS	4	3019.2
3220.3	T	0123	FW	F	NF	LH	20	45	3000	ØD	GR	3	09685	3	0	016.6	SEARS	1	3019.3
4220.3	T	0123	FW	F	NF	MH	20	45	3000	ØD	GR	3	01518	0	0	056.9	SEARS	E	3019.4
5220.3	T	0123	FW	F	NF	HH	20	45	3000	ØD	GR	3	04223	0	1	042.9	SEARS	A	3019.5
6220.3	T	0123	FW	F	NF	LL	20	45	3000	ØD	GR	3	08581	3	0	021.9	SEARS	A	3019.6
1218.3	U	0123	FW	F	NF	ML	20	45	3000	ØD	GR	3	05554	3	0	036.5	SEARS	4	3020.1
2218.3	U	0123	FW	F	NF	HL	20	45	3000	ØD	GR	3	05926	0	1	033.9	SEARS	4	3020.2
3218.3	U	0123	FW	F	NF	LH	20	45	3000	ØD	GR	3	04865	0	1	039.9	SEARS	4	3020.3
4218.3	U	0123	FW	F	NF	MH	20	45	3000	ØD	GR	3	01934	0	0	054.3	SEARS	D	3020.4
5218.3	U	0123	FW	F	NF	HH	20	45	3000	ØD	GR	3	01494	0	0	057.3	SEARS	D	3020.5
6218.3	U	0123	FW	F	NF	LL	20	45	3000	ØD	GR	3	07548	3	0	026.7	SEARS	D	3020.6
1223.4	T	0124	FW	F	WF	ML	20	45	3000	ØD	GR	3	05581	3	0	036.8	RØMANS	E	3021.1
2223.4	T	0124	FW	F	WF	HL	20	45	3000	ØD	GR	3	06111	3	0	033.4	RØMANS	A	3021.2
3223.4	T	0124	FW	F	WF	LH	20	45	3000	ØD	GR	3	02029	0	0	055.4	RØMANS	A	3021.3
4223.4	T	0124	FW	F	WF	MH	20	45	3000	ØD	GR	3	01075	0	0	061.7	RØMANS	A	3021.4
5223.4	T	0124	FW	F	WF	HH	20	45	3000	ØD	GR	3	02586	3	0	052.0	RØMANS	A	3021.5
6223.4	T	0124	FW	F	WF	LL	20	45	3000	ØD	GR	3	05763	3	0	035.9	RØMANS	A	3021.6
4221.3	U	0124	FW	F	WF	ML	20	45	3000	ØD	GR	3	05911	3	0	035.2	RØMANS	A	3022.1
5221.3	U	0124	FW	F	WF	HL	20	45	3000	ØD	GR	3	04010	3	0	044.6	RØMANS	A	3022.2
6221.3	U	0124	FW	F	WF	LH	20	45	3000	ØD	GR	3	05356	3	0	038.1	RØMANS	A	3022.3
1221.3	U	0124	FW	F	WF	MH	20	45	3000	ØD	GR	3	02480	0	1	052.6	RØMANS	1	3022.4
2221.3	U	0124	FW	F	WF	HH	20	45	3000	ØD	GR	3	02474	3	0	052.9	RØMANS	A	3022.5
3221.3	U	0124	FW	F	WF	LL	20	45	3000	ØD	GR	3	04708	3	0	041.3	RØMANS	A	3022.6
1224.3	T	0124	FW	F	VF	ML	20	45	3000	ØD	GR	3	06255	3	0	033.6	RØMANS	E	3023.1
2224.3	T	0124	FW	F	VF	HL	20	45	3000	ØD	GR	3	04695	3	0	040.5	RØMANS	E	3023.2
3224.3	T	0124	FW	F	VF	LH	20	45	3000	ØD	GR	3	06039	0	2	034.7	RØMANS	E	3023.3
4224.3	T	0124	FW	F	VF	MH	20	45	3000	ØD	GR	3	03902	0	3	044.9	RØMANS	E	3023.4
5224.3	T	0124	FW	F	VF	HH	20	45	3000	ØD	GR	3	03034	0	3	049.3	RØMANS	E	3023.5
6224.3	T	0124	FW	F	VF	LL	20	45	3000	ØD	GR	3	05808	3	0	035.6	RØMANS	E	3023.6
4222.3	U	0124	FW	F	VF	ML	20	45	3000	ØD	GR	3	06436	3	0	032.8	RØMANS	A	3024.1
5222.3	U	0124	FW	F	VF	HL	20	45	3000	ØD	GR	3	04869	0	1	039.9	RØMANS	A	3024.2
6222.3	U	0124	FW	F	VF	LH	20	45	3000	ØD	GR	3	02024	0	0	055.7	RØMANS	A	3024.3
1222.3	U	0124	FW	F	VF	MH	20	45	3000	ØD	GR	3	01086	0	0	062.4	RØMANS	A	3024.4
2222.3	U	0124	FW	F	VF	HH	20	45	3000	ØD	GR	3	02397	1	0	062.4	RØMANS	A	3024.5
3222.3	U	0124	FW	F	VF	LL	20	45	3000	ØD	GR	3	01694	0	0	057.4	RØMANS	A	3024.6
1209.3	T	0123	FW	F	DV	ML	20	90	3000	ØD	GR	3	02785	0	3	053.1	RØMANS	A	3025.1
2209.3	T	0123	FW	F	DV	HL	20	90	3000	ØD	GR	3	03628	0	2	048.5	RØMANS	1	3025.2
3209.3	T	0123	FW	F	DV	LH	20	90	3000	ØD	GR	3	08430	3	0	024.8	RØMANS	1	3025.3
4209.3	T	0123	FW	F	DV	MH	20	90	3000	ØD	GR	3	09143	0	5	020.4	RØMANS	1	3025.4
5209.3	T	0123	FW	F	DV	HH	20	90	3000	ØD	GR	3	02161	0	0	058.0	RØMANS	1	3025.5
6209.3	T	0123	FW	F	DV	LL	20	90	3000	ØD	GR	3	06079	3	0	036.2	RØMANS	1	3025.6
1213.3	U	0123	FW	F	DV	ML	20	90	3000	ØD	GR	3	03371	0	1	049.2	SEARS	1	3026.1
2213.3	U	0123	FW	F	DV	HL	20	90	3000	ØD	GR	3	04113	0	2	044.9	SEARS	1	3026.2
3213.3	U	0123	FW	F	DV	LH	20	90	3000	ØD	GR	3	03012	0	2	051.5	SEARS	1	3026.3
4213.3	U	0123	FW	F	DV	MH	20	90	3000	ØD	GR	3	03098	3	0	050.5	SEARS	A	3026.4
5213.3	U	0123	FW	F	DV	HH	20	90	3000	ØD	GR	3	02242	0	0	056.1	SEARS	A	3026.5
6213.3	U	0123	FW	F	DV	LL	20	90	3000	ØD	GR	3	02337	0	0	056.3	SEARS	A	3026.6
1210.4	T	0123	FW	F	NF	ML	20	90	3000	ØD	GR	3	03803	3	2	048.2	RØMANS	1	3027.1

2210.4	T	0123	FW	F	NF	HL	20	90	3000	ØD	GR	3	03293	0	2	050.9	RØMANS	1	3027.2
3210.4	T	0123	FW	F	NF	LH	20	90	3000	ØD	GR	3	02794	3	0	053.6	RØMANS	4	3027.3
4210.4	T	0123	FW	F	NF	MH	20	90	3000	ØD	GR	3	02066	0	3	057.2	RØMANS	1	3027.4
5210.4	T	0123	FW	F	NF	HH	20	90	3000	ØD	GR	3	02198	0	0	057.3	RØMANS	4	3027.5
6210.4	T	0123	FW	F	NF	LL	20	90	3000	ØD	GR	3	02815	3	0	052.9	RØMANS	4	3027.6
1214.3	U	0123	FW	F	NF	ML	20	90	3000	ØD	GR	3	07187	3	0	029.8	SEARS	6	3028.1
2214.3	U	0123	FW	F	NF	HL	20	90	3000	ØD	GR	3	03216	0	1	049.1	SEARS	6	3028.2
3214.3	U	0123	FW	F	NF	LH	20	90	3000	ØD	GR	3	04190	3	0	045.1	SEARS	4	3028.3
4214.3	U	0123	FW	F	NF	MH	20	90	3000	ØD	GR	3	02172	0	0	056.3	SEARS	D	3028.4
5214.3	U	0123	FW	F	NF	HH	20	90	3000	ØD	GR	3	02260	0	0	055.7	SEARS	D	3028.5
6214.3	U	0123	FW	F	NF	LL	20	90	3000	ØD	GR	3	03888	3	0	047.0	SEARS	D	3028.6
1211.3	T	0123	FW	F	WF	ML	20	90	3000	ØD	GR	3	01410	3	0	063.0	RØMANS	A	3029.1
2211.3	T	0123	FW	F	WF	HL	20	90	3000	ØD	GR	3	02923	0	2	052.5	RØMANS	1	3029.2
3211.3	T	0123	FW	F	WF	LH	20	90	3000	ØD	GR	3	05276	3	0	040.3	RØMANS	4	3029.3
4211.3	T	0123	FW	F	WF	MH	20	90	3000	ØD	GR	3	01778	0	0	058.7	RØMANS	4	3029.4
5211.3	T	0123	FW	F	WF	HH	20	90	3000	ØD	GR	3	03139	0	1	051.0	RØMANS	1	3029.5
6211.3	T	0123	FW	F	WF	LL	20	90	3000	ØD	GR	3	05406	3	0	040.0	RØMANS	4	3029.6
1215.3	U	0123	FW	F	WF	ML	20	90	3000	ØD	GR	3	02350	0	0	053.8	SEARS	4	3030.1
2215.3	U	0123	FW	F	WF	HL	20	90	3000	ØD	GR	3	03858	0	2	045.2	SEARS	1	3030.2
3215.3	U	0123	FW	F	WF	LH	20	90	3000	ØD	GR	3	03943	3	0	047.1	SEARS	D	3030.3
4215.3	U	0123	FW	F	WF	MH	20	90	3000	ØD	GR	3	02051	0	0	056.7	SEARS	D	3030.4
5215.3	U	0123	FW	F	WF	HH	20	90	3000	ØD	GR	3	02225	0	0	056.1	SEARS	D	3030.5
6215.3	U	0123	FW	F	WF	LL	20	90	3000	ØD	GR	3	02221	0	0	056.0	SEARS	D	3030.6
1212.3	T	0123	FW	F	VF	ML	20	90	3000	ØD	GR	3	01385	0	0	062.6	RØMANS	1	3031.1
2212.3	T	0123	FW	F	VF	HL	20	90	3000	ØD	GR	3	02998	0	0	052.8	RØMANS	1	3031.2
3212.3	T	0123	FW	F	VF	LH	20	90	3000	ØD	GR	3	08441	0	2	024.0	RØMANS	7	3031.3
4212.3	T	0123	FW	F	VF	MH	20	90	3000	ØD	GR	3	02426	3	0	054.8	RØMANS	1	3031.4
5212.3	T	0123	FW	F	VF	HH	20	90	3000	ØD	GR	3	02203	0	0	057.5	RØMANS	4	3031.5
6212.3	T	0123	FW	F	VF	LL	20	90	3000	ØD	GR	3	05060	0	1	041.2	RØMANS	2	3031.6
1216.4	U	0123	FW	F	VF	ML	20	90	3000	ØD	GR	3	01930	0	0	056.6	SEARS	4	3032.1
2216.4	U	0123	FW	F	VF	HL	20	90	3000	ØD	GR	3	02833	0	0	051.6	SEARS	4	3032.2
3216.4	U	0123	FW	F	VF	LH	20	90	3000	ØD	GR	3	03734	3	0	048.1	SEARS	4	3032.3
9999.9			FW	F	VF	MH	20	90	3000	ØD	GR	3	00000	0	0	000.0	NØT RUN		3032.4
9999.9			FW	F	VF	HH	20	90	3000	ØD	GR	3	00000	0	0	000.0	NØT RUN		3032.5
9999.9			FW	F	VF	LL	20	90	3000	ØD	GR	3	00000	0	0	000.0	NØT RUN		3032.6
1205.4	T	0122	FW	F	DV	ML	20	135	3000	ØD	GR	3	07022	3	0	031.1	SEARS	1	3033.1
2205.4	T	0122	FW	F	DV	HL	20	135	3000	ØD	GR	3	08110	0	2	024.8	SEARS	1	3033.2
3205.4	T	0122	FW	F	DV	LH	20	135	3000	ØD	GR	3	08971	0	3	021.5	SEARS	1	3033.3
4205.4	T	0122	FW	F	DV	MH	20	135	3000	ØD	GR	3	09106	0	4	020.6	SEARS	1	3033.4
5205.4	T	0122	FW	F	DV	HH	20	135	3000	ØD	GR	3	08703	0	1	022.8	SEARS	1	3033.5
6205.4	T	0122	FW	F	DV	LL	20	135	3000	ØD	GR	3	08722	2	0	023.1	SEARS	1	3033.6
1197.3	U	0122	FW	F	DV	ML	20	135	3000	ØD	GR	3	05169	0	3	041.0	RØMANS	1	3034.1
2197.3	U	0122	FW	F	DV	HL	20	135	3000	ØD	GR	3	01527	0	0	061.1	RØMANS	1	3034.2
3197.3	U	0122	FW	F	DV	LH	20	135	3000	ØD	GR	3	07899	3	0	027.4	RØMANS	1	3034.3
4197.3	U	0122	FW	F	DV	MH	20	135	3000	ØD	GR	3	07286	0	4	030.2	RØMANS	A	3034.4
5197.3	U	0122	FW	F	DV	HH	20	135	3000	ØD	GR	3	08841	2	0	022.5	RØMANS	1	3034.5
6197.3	U	0122	FW	F	DV	LL	20	135	3000	ØD	GR	3	08971	0	1	022.3	RØMANS	1	3034.6
1206.4	T	0122	FW	F	NF	ML	20	135	3000	ØD	GR	3	05429	0	4	039.3	SEARS	4	3035.1
2206.4	T	0122	FW	F	NF	HL	20	135	3000	ØD	GR	3	05142	0	2	040.1	SEARS	4	3035.2
3206.4	T	0122	FW	F	NF	LH	20	135	3000	ØD	GR	3	05173	3	0	041.1	SEARS	4	3035.3
4206.4	T	0122	FW	F	NF	MH	20	135	3000	ØD	GR	3	03886	0	3	047.5	SEARS	6	3035.4
5206.4	T	0122	FW	F	NF	HH	20	135	3000	ØD	GR	3	03716	0	4	048.5	SEARS	4	3035.5
6206.4	T	0122	FW	F	NF	LL	20	135	3000	ØD	GR	3	02231	0	3	057.2	SEARS	4	3035.6

1198.3	U	0122	FW	F	NF	ML	20	135	3000	OD	GR	3	01073	0	0	066.0	ROMANS	4	3036.1
2198.3	U	0122	FW	F	NF	HL	20	135	3000	OD	GR	3	01496	0	0	061.2	ROMANS	2	3036.2
3198.3	U	0122	FW	F	NF	LH	20	135	3000	OD	GR	3	02053	0	0	058.6	ROMANS	1	3036.3
4198.3	U	0122	FW	F	NF	MH	20	135	3000	OD	GR	3	01075	0	0	067.1	ROMANS	2	3036.4
5198.3	U	0122	FW	F	NF	HH	20	135	3000	OD	GR	3	01121	0	0	065.9	ROMANS	1	3036.5
6198.3	U	0122	FW	F	NF	LL	20	135	3000	OD	GR	3	01670	0	0	061.8	ROMANS	1	3036.6
1207.3	T	0122	FW	F	WF	ML	20	135	3000	OD	GR	3	10472	3	0	013.7	SEARS	4	3037.1
2207.3	T	0122	FW	F	WF	HL	20	135	3000	OD	GR	3	09178	0	4	019.9	SEARS	4	3037.2
3207.3	T	0122	FW	F	WF	LH	20	135	3000	OD	GR	3	08443	0	4	024.2	SEARS	4	3037.3
4207.3	T	0122	FW	F	WF	MH	20	135	3000	OD	GR	3	04444	0	2	044.4	SEARS	4	3037.4
5207.3	T	0122	FW	F	WF	HH	20	135	3000	OD	GR	3	02846	0	2	053.0	SEARS	4	3037.5
6207.3	T	0122	FW	F	WF	LL	20	135	3000	OD	GR	3	04166	3	0	046.4	SEARS	4	3037.6
1199.3	U	0122	FW	F	WF	ML	20	135	3000	OD	GR	3	03701	0	3	048.7	ROMANS	1	3038.1
2199.3	U	0122	FW	F	WF	HL	20	135	3000	OD	GR	3	01687	0	0	059.7	ROMANS	1	3038.2
3199.3	U	0122	FW	F	WF	LH	20	135	3000	OD	GR	3	02745	3	0	054.7	ROMANS	1	3038.3
4199.3	U	0122	FW	F	WF	MH	20	135	3000	OD	GR	3	07149	0	4	030.7	ROMANS	A	3038.4
5199.3	U	0122	FW	F	WF	HH	20	135	3000	OD	GR	3	05360	3	1	040.1	ROMANS	1	3038.5
6199.3	U	0122	FW	F	WF	LL	20	135	3000	OD	GR	3	01670	0	0	061.3	ROMANS	1	3038.6
1208.3	T	0122	FW	F	VF	ML	20	135	3000	OD	GR	3	01487	0	0	060.8	SEARS	4	3039.1
2208.3	T	0122	FW	F	VF	HL	20	135	3000	OD	GR	3	05045	0	3	040.5	SEARS	4	3039.2
3208.3	T	0122	FW	F	VF	LH	20	135	3000	OD	GR	3	05753	3	0	038.1	SEARS	4	3039.3
4208.3	T	0122	FW	F	VF	MH	20	135	3000	OD	GR	3	06799	0	6	032.4	SEARS	4	3039.4
5208.3	T	0122	FW	F	VF	HH	20	135	3000	OD	GR	3	02751	3	0	053.8	SEARS	4	3039.5
6208.3	T	0122	FW	F	VF	LL	20	135	3000	OD	GR	3	01826	0	0	059.7	SEARS	4	3039.6
1200.3	U	0122	FW	F	VF	ML	20	135	3000	OD	GR	3	01075	0	0	067.3	ROMANS	1	3040.1
2200.3	U	0122	FW	F	VF	HL	20	135	3000	OD	GR	3	01628	0	0	059.9	ROMANS	1	3040.2
3200.3	U	0122	FW	F	VF	LH	20	135	3000	OD	GR	3	03665	3	0	049.3	ROMANS	4	3040.3
4200.3	U	0122	FW	F	VF	MH	20	135	3000	OD	GR	3	01077	0	0	065.9	ROMANS	1	3040.4
5200.3	U	0122	FW	F	VF	HH	20	135	3000	OD	GR	3	01130	0	0	064.6	ROMANS	1	3040.5
6200.3	U	0122	FW	F	VF	LL	20	135	3000	OD	GR	3	04045	0	3	046.9	ROMANS	1	3040.6
1201.3	T	0122	FW	F	DV	ML	20	180	3000	OD	GR	3	04252	0	1	045.2	SEARS	1	3049.1
2201.3	T	0122	FW	F	DV	HL	20	180	3000	OD	GR	3	03336	0	1	050.1	SEARS	1	3049.2
3201.3	T	0122	FW	F	DV	LH	20	180	3000	OD	GR	3	09699	3	0	017.8	SEARS	1	3049.3
4201.3	T	0122	FW	F	DV	MH	20	180	3000	OD	GR	3	01518	0	0	060.5	SEARS	1	3049.4
5201.3	T	0122	FW	F	DV	HH	20	180	3000	OD	GR	3	03580	0	1	049.2	SEARS	1	3049.5
6201.3	T	0122	FW	F	DV	LL	20	180	3000	OD	GR	3	08912	3	0	022.1	SEARS	1	3049.6
1193.3	U	0122	FW	F	DV	ML	20	180	3000	OD	GR	3	01123	0	0	066.0	ROMANS	1	3050.1
2193.3	U	0122	FW	F	DV	HL	20	180	3000	OD	GR	3	03534	0	2	049.6	ROMANS	1	3050.2
3193.3	U	0122	FW	F	DV	LH	20	180	3000	OD	GR	3	03113	3	0	053.7	ROMANS	1	3050.3
4193.3	U	0122	FW	F	DV	MH	20	180	3000	OD	GR	3	03371	0	3	051.0	ROMANS	1	3050.4
5193.3	U	0122	FW	F	DV	HH	20	180	3000	OD	GR	3	01075	0	0	067.5	ROMANS	1	3050.5
6193.3	U	0122	FW	F	DV	LL	20	180	3000	OD	GR	3	03628	3	0	050.7	ROMANS	1	3050.6
1202.4	T	0122	FW	F	NF	ML	20	180	3000	OD	GR	3	01921	0	2	057.9	SEARS	4	3051.1
2202.4	T	0122	FW	F	NF	HL	20	180	3000	OD	GR	3	03421	0	2	049.0	SEARS	4	3051.2
3202.4	T	0122	FW	F	NF	LH	20	180	3000	OD	GR	3	03864	0	3	048.1	SEARS	4	3051.3
4202.4	T	0122	FW	F	NF	MH	20	180	3000	OD	GR	3	02002	0	0	057.7	SEARS	4	3051.4
5202.4	T	0122	FW	F	NF	HH	20	180	3000	OD	GR	3	02099	0	1	057.3	SEARS	4	3051.5
6202.4	T	0122	FW	F	NF	LL	20	180	3000	OD	GR	3	03714	3	0	049.7	SEARS	4	3051.6
1194.3	U	0122	FW	F	NF	ML	20	180	3000	OD	GR	3	01090	0	0	066.3	ROMANS	1	3052.1
2194.3	U	0122	FW	F	NF	HL	20	180	3000	OD	GR	3	01500	0	0	061.7	ROMANS	1	3052.2
3194.3	U	0122	FW	F	NF	LH	20	180	3000	OD	GR	3	07971	0	3	027.3	ROMANS	1	3052.3
4194.3	U	0122	FW	F	NF	MH	20	180	3000	OD	GR	3	03084	0	1	052.4	ROMANS	4	3052.4
5194.3	U	0122	FW	F	NF	HH	20	180	3000	OD	GR	3	02439	0	1	056.2	ROMANS	4	3052.5

6194.3	U	0122	FW	F	NF	LL	20	180	3000	ØD	GR	3	04360	0	1	046.4	RØMANS	2	3052.6
1203.3	T	0122	FW	F	WF	ML	20	180	3000	ØD	GR	3	03250	3	0	050.4	SEARS	4	3053.1
2203.3	T	0122	FW	F	WF	HL	20	180	3000	ØD	GR	3	02393	0	1	054.6	SEARS	6	3053.2
3203.3	T	0122	FW	F	WF	LH	20	180	3000	ØD	GR	3	06764	0	2	032.9	SEARS	6	3053.3
4203.3	T	0122	FW	F	WF	MH	20	180	3000	ØD	GR	3	01910	0	1	058.1	SEARS	4	3053.4
5203.3	T	0122	FW	F	WF	HH	20	180	3000	ØD	GR	3	01575	0	0	060.9	SEARS	6	3053.5
6203.3	T	0122	FW	F	WF	LL	20	180	3000	ØD	GR	3	05453	3	0	040.1	SEARS	6	3053.6
1195.3	U	0122	FW	F	WF	ML	20	180	3000	ØD	GR	3	03152	0	3	052.2	RØMANS	1	3054.1
2195.3	U	0122	FW	F	WF	HL	20	180	3000	ØD	GR	3	01809	0	0	059.6	RØMANS	1	3054.2
3195.3	U	0122	FW	F	WF	LH	20	180	3000	ØD	GR	3	05074	3	0	042.8	RØMANS	1	3054.3
4195.3	U	0122	FW	F	WF	MH	20	180	3000	ØD	GR	3	01077	0	0	066.2	RØMANS	1	3054.4
5195.3	U	0122	FW	F	WF	HH	20	180	3000	ØD	GR	3	03146	0	1	052.3	RØMANS	1	3054.5
6195.3	U	0122	FW	F	WF	LL	20	180	3000	ØD	GR	3	04796	0	1	044.1	RØMANS	1	3054.6
1204.4	T	0122	FW	F	VF	ML	20	180	3000	ØD	GR	3	03293	2	0	050.5	SEARS	4	3055.1
2204.4	T	0122	FW	F	VF	HL	20	180	3000	ØD	GR	3	03728	0	0	047.6	SEARS	4	3055.2
3204.4	T	0122	FW	F	VF	LH	20	180	3000	ØD	GR	3	02190	0	0	057.7	SEARS	4	3055.3
4204.4	T	0122	FW	F	VF	MH	20	180	3000	ØD	GR	3	01494	0	0	060.9	SEARS	4	3055.4
5204.4	T	0122	FW	F	VF	HH	20	180	3000	ØD	GR	3	01701	0	0	059.6	SEARS	4	3055.5
6204.4	T	0122	FW	F	VF	LL	20	180	3000	ØD	GR	3	04900	0	1	042.7	SEARS	4	3055.6
1196.3	U	0122	FW	F	VF	ML	20	180	3000	ØD	GR	3	01104	0	0	065.8	RØMANS	1	3056.1
2196.3	U	0122	FW	F	VF	HL	20	180	3000	ØD	GR	3	03214	0	1	051.1	RØMANS	1	3056.2
3196.3	U	0122	FW	F	VF	LH	20	180	3000	ØD	GR	3	02042	0	0	059.6	RØMANS	2	3056.3
4196.3	U	0122	FW	F	VF	MH	20	180	3000	ØD	GR	3	02562	0	5	055.1	RØMANS	4	3056.4
5196.3	U	0122	FW	F	VF	HH	20	180	3000	ØD	GR	3	03293	0	1	051.4	RØMANS	2	3056.5
6196.3	U	0122	FW	F	VF	LL	20	180	3000	ØD	GR	3	03622	3	0	050.4	RØMANS	2	3056.6

****** DATA FROM SEEKVAL EXPERIMENT 4 ******

1313.0	T	0210	RW	G	DV	LL	90	--	0800	OD	GR	3	01500	3	0	001.2	SEARS	1	4001.1
2313.0	T	0210	RW	G	DV	ML	90	--	0800	OD	GR	3	01500	3	0	002.3	SEARS	1	4001.2
3313.0	T	0210	RW	G	DV	LH	90	--	0800	OD	GR	3	01500	3	0	000.5	SEARS	1	4001.3
4313.0	T	0210	RW	G	DV	MH	90	--	0800	OD	GR	3	01500	3	0	003.2	SEARS	1	4001.4
1301.4	U	0210	RW	G	DV	LL	90	--	0800	OD	GR	3	01500	3	0	002.0	ROMANS	1	4002.1
2301.4	U	0210	RW	G	DV	ML	90	--	0800	OD	GR	3	01500	3	0	001.4	ROMANS	1	4002.2
3301.4	U	0210	RW	G	DV	LH	90	--	0800	OD	GR	3	01500	3	0	001.6	ROMANS	1	4002.3
4301.4	U	0210	RW	G	DV	MH	90	--	0800	OD	GR	3	01500	3	0	002.6	ROMANS	1	4002.4
1314.4	T	0210	RW	G	SO	LL	90	--	0800	OD	GR	3	01500	3	0	006.9	SEARS	1	4003.1
2314.4	T	0210	RW	G	SO	ML	90	--	0800	OD	GR	3	01500	3	0	002.0	SEARS	1	4003.2
3314.4	T	0210	RW	G	SO	LH	90	--	0800	OD	GR	3	01500	3	0	001.4	SEARS	1	4003.3
4314.4	T	0210	RW	G	SO	MH	90	--	0800	OD	GR	3	01500	3	0	002.8	SEARS	1	4003.4
1302.3	U	0210	RW	G	SO	LL	90	--	0800	OD	GR	3	01500	3	0	002.2	ROMANS	1	4004.1
2302.3	U	0210	RW	G	SO	ML	90	--	0800	OD	GR	3	01500	3	0	001.8	ROMANS	1	4004.2
3302.3	U	0210	RW	G	SO	LH	90	--	0800	OD	GR	3	01500	3	0	007.4	ROMANS	1	4004.3
4302.3	U	0210	RW	G	SO	MH	90	--	0800	OD	GR	3	01500	0	0	007.0	ROMANS	N	4004.4
1315.3	T	0210	RW	G	EO	LL	90	--	0800	OD	GR	3	01500	3	0	002.5	SEARS	1	4005.1
2315.3	T	0210	RW	G	EO	ML	90	--	0800	OD	GR	3	01500	3	0	001.9	SEARS	1	4005.2
3315.3	T	0210	RW	G	EO	LH	90	--	0800	OD	GR	3	01500	3	0	001.0	SEARS	1	4005.3
4315.3	T	0210	RW	G	EO	MH	90	--	0800	OD	GR	3	01500	3	0	002.6	SEARS	1	4005.4
1303.3	U	0210	RW	G	EO	LL	90	--	0800	OD	GR	3	01500	3	0	002.5	ROMANS	1	4006.1
2303.3	U	0210	RW	G	EO	ML	90	--	0800	OD	GR	3	01500	3	0	002.0	ROMANS	1	4006.2
3303.3	U	0210	RW	G	EO	LH	90	--	0800	OD	GR	3	01500	3	0	001.8	ROMANS	1	4006.3
4303.3	U	0210	RW	G	EO	MH	90	--	0800	OD	GR	3	01500	3	0	002.0	ROMANS	1	4006.4
1316.4	T	0210	RW	G	DV	LL	90	--	0800	OD	GR	3	02850	3	0	001.9	SEARS	1	4007.1
2316.4	T	0210	RW	G	DV	ML	90	--	0800	OD	GR	3	02850	3	0	002.1	SEARS	1	4007.2
3316.4	T	0210	RW	G	DV	LH	90	--	0800	OD	GR	3	02850	3	0	003.5	SEARS	1	4007.3
4316.4	T	0210	RW	G	DV	MH	90	--	0800	OD	GR	3	02850	3	0	002.3	SEARS	1	4007.4
1304.3	U	0210	RW	G	DV	LL	90	--	0800	OD	GR	3	02850	3	0	010.8	ROMANS	A	4008.1
2304.3	U	0210	RW	G	DV	ML	90	--	0800	OD	GR	3	02850	3	0	004.1	ROMANS	1	4008.2
3304.3	U	0210	RW	G	DV	LH	90	--	0800	OD	GR	3	02850	3	0	001.4	ROMANS	1	4008.3
4304.3	U	0210	RW	G	DV	MH	90	--	0800	OD	GR	3	02850	0	2	058.7	ROMANS	1	4008.4
1317.4	T	0210	RW	G	SO	LL	90	--	0800	OD	GR	3	02850	3	0	002.0	SEARS	1	4009.1
2317.4	T	0210	RW	G	SO	ML	90	--	0800	OD	GR	3	02850	3	0	002.1	SEARS	1	4009.2
3317.4	T	0210	RW	G	SO	LH	90	--	0800	OD	GR	3	02850	3	0	001.4	SEARS	1	4009.3
4317.4	T	0210	RW	G	SO	MH	90	--	0800	OD	GR	3	02850	1	0	014.0	SEARS	1	4009.4
1305.4	U	0210	RW	G	SO	LL	90	--	0800	OD	GR	3	02850	3	0	003.4	ROMANS	1	4010.1
2305.4	U	0210	RW	G	SO	ML	90	--	0800	OD	GR	3	02850	3	0	010.0	ROMANS	9	4010.2
3305.4	U	0210	RW	G	SO	LH	90	--	0800	OD	GR	3	02850	3	0	006.1	ROMANS	8	4010.3
4305.4	U	0210	RW	G	SO	MH	90	--	0800	OD	GR	3	02850	3	0	006.8	ROMANS	8	4010.4
1318.3	T	0210	RW	G	EO	LL	90	--	0800	OD	GR	3	02850	3	0	002.6	SEARS	1	4011.1
2318.3	T	0210	RW	G	EO	ML	90	--	0800	OD	GR	3	02850	3	0	002.5	SEARS	1	4011.2
3318.3	T	0210	RW	G	EO	LH	90	--	0800	OD	GR	3	02850	2	1	001.4	SEARS	1	4011.3
4318.3	T	0210	RW	G	EO	MH	90	--	0800	OD	GR	3	02850	2	0	003.4	SEARS	1	4011.4
1306.4	U	0210	RW	G	EO	LL	90	--	0800	OD	GR	3	02850	3	0	011.1	ROMANS	1	4012.1
2306.4	U	0210	RW	G	EO	ML	90	--	0800	OD	GR	3	02850	0	0	006.3	ROMANS	N	4012.2
3306.4	U	0210	RW	G	EO	LH	90	--	0800	OD	GR	3	02850	3	0	002.3	ROMANS	1	4012.3
4306.4	U	0210	RW	G	EO	MH	90	--	0800	OD	GR	3	02850	0	0	060.0	ROMANS	J	4012.4
1319.3	T	0210	RW	G	DV	LL	90	--	0800	OD	GR	3	04200	3	0	002.3	SEARS	1	4013.1
2319.3	T	0210	RW	G	DV	ML	90	--	0800	OD	GR	3	04200	2	0	002.9	SEARS	1	4013.2
3319.3	T	0210	RW	G	DV	LH	90	--	0800	OD	GR	3	04200	3	0	001.4	SEARS	1	4013.3

4319.3	T	0210	RW	G	DV	MH	90	--	0800	ØD	GR	3	04200	2	0	007.9	SEARS	1	4013.4
1307.3	U	0210	RW	G	DV	LL	90	--	0800	ØD	GR	3	04200	3	0	002.2	RØMANS	1	4014.1
2307.3	U	0210	RW	G	DV	ML	90	--	0800	ØD	GR	3	04200	3	0	006.4	RØMANS	1	4014.2
3307.3	U	0210	RW	G	DV	LH	90	--	0800	ØD	GR	3	04200	3	0	002.7	RØMANS	1	4014.3
4307.3	U	0210	RW	G	DV	MH	90	--	0800	ØD	GR	3	04200	0	1	016.1	RØMANS	1	4014.4
1320.4	T	0210	RW	G	SØ	LL	90	--	0800	ØD	GR	3	04200	3	0	003.2	SEARS	1	4015.1
2320.4	T	0210	RW	G	SØ	ML	90	--	0800	ØD	GR	3	04200	3	0	009.0	SEARS	1	4015.2
3320.4	T	0210	RW	G	SØ	LH	90	--	0800	ØD	GR	3	04200	3	0	002.0	SEARS	1	4015.3
4320.4	T	0210	RW	G	SØ	MH	90	--	0800	ØD	GR	3	04200	3	0	009.9	SEARS	8	4015.4
1308.4	U	0210	RW	G	SØ	LL	90	--	0800	ØD	GR	3	04200	3	0	003.3	RØMANS	1	4016.1
2308.4	U	0210	RW	G	SØ	ML	90	--	0800	ØD	GR	3	04200	0	0	004.8	RØMANS	N	4016.2
3308.4	U	0210	RW	G	SØ	LH	90	--	0800	ØD	GR	3	04200	3	0	003.9	RØMANS	9	4016.3
4308.4	U	0210	RW	G	SØ	MH	90	--	0800	ØD	GR	3	04200	0	3	006.5	RØMANS	H	4016.4
1321.4	T	0210	RW	G	EØ	LL	90	--	0800	ØD	GR	3	04200	3	0	007.9	SEARS	9	4017.1
2321.4	T	0210	RW	G	EØ	ML	90	--	0800	ØD	GR	3	04200	3	0	007.4	SEARS	1	4017.2
3321.4	T	0210	RW	G	EØ	LH	90	--	0800	ØD	GR	3	04200	3	0	006.0	SEARS	9	4017.3
4321.4	T	0210	RW	G	EØ	MH	90	--	0800	ØD	GR	3	04200	3	0	008.6	SEARS	9	4017.4
1309.4	U	0210	RW	G	EØ	LL	90	--	0800	ØD	GR	3	04200	3	0	033.3	RØMANS	6	4018.1
2309.4	U	0210	RW	G	EØ	ML	90	--	0800	ØD	GR	3	04200	3	0	048.0	RØMANS	4	4018.2
3309.4	U	0210	RW	G	EØ	LH	90	--	0800	ØD	GR	3	04200	3	0	039.9	RØMANS	A	4018.3
4309.4	U	0210	RW	G	EØ	MH	90	--	0800	ØD	GR	3	04200	0	0	060.0	RØMANS	7	4018.4
1322.4	T	0210	RW	G	DV	LL	90	--	1300	ØD	GR	3	01500	3	0	001.5	SEARS	1	4019.1
2322.4	T	0210	RW	G	DV	ML	90	--	1300	ØD	GR	3	01500	3	0	002.6	SEARS	1	4019.2
3322.4	T	0210	RW	G	DV	LH	90	--	1300	ØD	GR	3	01500	3	0	001.0	SEARS	1	4019.3
4322.4	T	0210	RW	G	DV	MH	90	--	1300	ØD	GR	3	01500	3	0	001.3	SEARS	1	4019.4
1310.4	U	0210	RW	G	DV	LL	90	--	1300	ØD	GR	3	01500	3	0	009.8	RØMANS	1	4020.1
2310.4	U	0210	RW	G	DV	ML	90	--	1300	ØD	GR	3	01500	3	0	002.5	RØMANS	1	4020.2
3310.4	U	0210	RW	G	DV	LH	90	--	1300	ØD	GR	3	01500	3	0	001.0	RØMANS	1	4020.3
4310.4	U	0210	RW	G	DV	MH	90	--	1300	ØD	GR	3	01500	3	0	001.2	RØMANS	1	4020.4
1323.4	T	0210	RW	G	SØ	LL	90	--	1300	ØD	GR	3	01500	3	0	001.2	SEARS	1	4021.1
2323.4	T	0210	RW	G	SØ	ML	90	--	1300	ØD	GR	3	01500	3	0	001.3	SEARS	1	4021.2
3323.4	T	0210	RW	G	SØ	LH	90	--	1300	ØD	GR	3	01500	3	0	001.3	SEARS	1	4021.3
4323.4	T	0210	RW	G	SØ	MH	90	--	1300	ØD	GR	3	01500	3	0	001.0	SEARS	1	4021.4
1311.3	U	0210	RW	G	SØ	LL	90	--	1300	ØD	GR	3	01500	3	0	006.0	RØMANS	1	4022.1
2311.3	U	0210	RW	G	SØ	ML	90	--	1300	ØD	GR	3	01500	3	0	002.7	RØMANS	1	4022.2
3311.3	U	0210	RW	G	SØ	LH	90	--	1300	ØD	GR	3	01500	3	0	001.4	RØMANS	1	4022.3
4311.3	U	0210	RW	G	SØ	MH	90	--	1300	ØD	GR	3	01500	3	0	016.9	RØMANS	9	4022.4
1324.4	T	0210	RW	G	EØ	LL	90	--	1300	ØD	GR	3	01500	3	0	006.9	SEARS	1	4023.1
2324.4	T	0210	RW	G	EØ	ML	90	--	1300	ØD	GR	3	01500	3	0	001.2	SEARS	1	4023.2
3324.4	T	0210	RW	G	EØ	LH	90	--	1300	ØD	GR	3	01500	3	0	002.3	SEARS	1	4023.3
4324.4	T	0210	RW	G	EØ	MH	90	--	1300	ØD	GR	3	01500	3	0	001.3	SEARS	1	4023.4
1312.4	U	0210	RW	G	EØ	LL	90	--	1300	ØD	GR	3	01500	3	0	002.1	RØMANS	1	4024.1
2312.4	U	0210	RW	G	EØ	ML	90	--	1300	ØD	GR	3	01500	3	0	001.5	RØMANS	1	4024.2
3312.4	U	0210	RW	G	EØ	LH	90	--	1300	ØD	GR	3	01500	3	0	001.2	RØMANS	1	4024.3
4312.4	U	0210	RW	G	EØ	MH	90	--	1300	ØD	GR	3	01500	3	0	001.2	RØMANS	1	4024.4
1337.4	T	0211	RW	G	DV	LL	90	--	1300	ØD	GR	3	02850	3	0	002.4	SEARS	1	4025.1
2337.4	T	0211	RW	G	DV	ML	90	--	1300	ØD	GR	3	02850	3	0	003.9	SEARS	1	4025.2
3337.4	T	0211	RW	G	DV	LH	90	--	1300	ØD	GR	3	02850	3	0	002.7	SEARS	1	4025.3
4337.4	T	0211	RW	G	DV	MH	90	--	1300	ØD	GR	3	02850	3	0	003.9	SEARS	1	4025.4
1325.4	U	0211	RW	G	DV	LL	90	--	1300	ØD	GR	3	02850	3	0	002.0	RØMANS	1	4026.1
2325.4	U	0211	RW	G	DV	ML	90	--	1300	ØD	GR	3	02850	3	0	002.5	RØMANS	1	4026.2
3325.4	U	0211	RW	G	DV	LH	90	--	1300	ØD	GR	3	02850	3	0	003.0	RØMANS	1	4026.3
4325.4	U	0211	RW	G	DV	MH	90	--	1300	ØD	GR	3	02850	3	0	006.8	RØMANS	1	[illegible]

1338.3	T	0211	RW	G	SØ	LL	90	--	1300	ØD	GR	3	02850	3	0	007.1	RØMANS	A	4027.1
2338.3	T	0211	RW	G	SØ	ML	90	--	1300	ØD	GR	3	02850	3	0	004.1	RØMANS	A	4027.2
3338.3	T	0211	RW	G	SØ	LH	90	--	1300	ØD	GR	3	02850	3	0	001.6	RØMANS	1	4027.3
4338.3	T	0211	RW	G	SØ	MH	90	--	1300	ØD	GR	3	02850	3	0	005.3	RØMANS	1	4027.4
1326.3	U	0211	RW	G	SØ	LL	90	--	1300	ØD	GR	3	02850	3	0	004.0	RØMANS	1	4028.1
2326.3	U	0211	RW	G	SØ	ML	90	--	1300	ØD	GR	3	02850	3	0	001.5	RØMANS	1	4028.2
3326.3	U	0211	RW	G	SØ	LH	90	--	1300	ØD	GR	3	02850	0	0	007.6	RØMANS	N	4028.3
4326.3	U	0211	RW	G	SØ	MH	90	--	1300	ØD	GR	3	02850	0	0	060.0	RØMANS	J	4028.4
1339.4	T	0211	RW	G	EØ	LL	90	--	1300	ØD	GR	3	02850	3	0	002.1	SEARS	1	4029.1
2339.4	T	0211	RW	G	EØ	ML	90	--	1300	ØD	GR	3	02850	3	0	002.4	SEARS	1	4029.2
3339.4	T	0211	RW	G	EØ	LH	90	--	1300	ØD	GR	3	02850	0	3	009.2	SEARS	1	4029.3
4339.4	T	0211	RW	G	EØ	MH	90	--	1300	ØD	GR	3	02850	3	0	002.8	SEARS	1	4029.4
1327.3	U	0211	RW	G	EØ	LL	90	--	1300	ØD	GR	3	02850	3	0	004.9	RØMANS	1	4030.1
2327.3	U	0211	RW	G	EØ	ML	90	--	1300	ØD	GR	3	02850	3	0	003.7	RØMANS	1	4030.2
3327.3	U	0211	RW	G	EØ	LH	90	--	1300	ØD	GR	3	02850	3	0	024.9	RØMANS	1	4030.3
4327.3	U	0211	RW	G	EØ	MH	90	--	1300	ØD	GR	3	02850	3	0	009.9	RØMANS	1	4030.4
1340.3	T	0211	RW	G	DV	LL	90	--	1300	ØD	GR	3	04200	3	0	002.8	RØMANS	1	4031.1
2340.3	T	0211	RW	G	DV	ML	90	--	1300	ØD	GR	3	04200	3	2	001.7	RØMANS	1	4031.2
3340.3	T	0211	RW	G	DV	ML	90	--	1300	ØD	GR	3	04200	3	0	001.5	RØMANS	1	4031.3
4340.3	T	0211	RW	G	DV	MH	90	--	1300	ØD	GR	3	04200	1	1	010.2	RØMANS	A	4031.4
1328.3	U	0211	RW	G	DV	LL	90	--	1300	ØD	GR	3	04200	3	0	001.9	RØMANS	1	4032.1
2328.3	U	0211	RW	G	DV	ML	90	--	1300	ØD	GR	3	04200	3	0	006.0	RØMANS	1	4032.2
3328.3	U	0211	RW	G	DV	LH	90	--	1300	ØD	GR	3	04200	3	0	001.3	RØMANS	1	4032.3
4328.3	U	0211	RW	G	DV	MH	90	--	1300	ØD	GR	3	04200	3	0	006.3	RØMANS	1	4032.4
1341.4	T	0211	RW	G	SØ	LL	90	--	1300	ØD	GR	3	04200	3	0	015.1	SEARS	1	4033.1
2341.4	T	0211	RW	G	SØ	ML	90	--	1300	ØD	GR	3	04200	3	0	009.3	SEARS	1	4033.2
3341.4	T	0211	RW	G	SØ	LH	90	--	1300	ØD	GR	3	04200	3	0	003.7	SEARS	1	4033.3
4341.4	T	0211	RW	G	SØ	MH	90	--	1300	ØD	GR	3	04200	3	0	008.3	SEARS	8	4033.4
1329.3	U	0211	RW	G	SØ	LL	90	--	1300	ØD	GR	3	04200	3	0	022.8	RØMANS	J	4034.1
2329.3	U	0211	RW	G	SØ	ML	90	--	1300	ØD	GR	3	04200	3	0	010.0	RØMANS	9	4034.2
3329.3	U	0211	RW	G	SØ	LH	90	--	1300	ØD	GR	3	04200	3	0	002.1	RØMANS	1	4034.3
4329.3	U	0211	RW	G	SØ	MH	90	--	1300	ØD	GR	3	04200	3	0	015.6	RØMANS	9	4034.4
1342.4	T	0211	RW	G	EØ	LL	90	--	1300	ØD	GR	3	04200	3	0	002.1	RØMANS	1	4035.1
2342.4	T	0211	RW	G	EØ	ML	90	--	1300	ØD	GR	3	04200	3	0	005.1	RØMANS	1	4035.2
3342.4	T	0211	RW	G	EØ	LH	90	--	1300	ØD	GR	3	04200	3	0	010.4	RØMANS	1	4035.3
4342.4	T	0211	RW	G	EØ	MH	90	--	1300	ØD	GR	3	04200	3	0	031.6	RØMANS	5	4035.4
1330.3	U	0211	RW	G	EØ	LL	90	--	1300	ØD	GR	3	04200	3	0	006.2	RØMANS	1	4036.1
2330.3	U	0211	RW	G	EØ	ML	90	--	1300	ØD	GR	3	04200	3	0	004.3	RØMANS	1	4036.2
3330.3	U	0211	RW	G	EØ	LH	90	--	1300	ØD	GR	3	04200	3	0	003.5	RØMANS	1	4036.3
4330.3	U	0211	RW	G	EØ	MH	90	--	1300	ØD	GR	3	04200	3	0	043.0	RØMANS	7	4036.4
1343.4	T	0211	RW	G	DV	LL	90	--	1800	ØD	GR	3	01500	3	0	001.3	SEARS	1	4037.1
2343.4	T	0211	RW	G	DV	ML	90	--	1800	ØD	GR	3	01500	3	0	001.3	SEARS	1	4037.2
3343.4	T	0211	RW	G	DV	LH	90	--	1800	ØD	GR	3	01500	3	0	002.3	SEARS	1	4037.3
4343.4	T	0211	RW	G	DV	MH	90	--	1800	ØD	GR	3	01500	3	0	002.1	SEARS	1	4037.4
1331.4	U	0211	RW	G	DV	LL	90	--	1800	ØD	GR	3	01500	3	0	001.5	RØMANS	1	4038.1
2331.4	U	0211	RW	G	DV	ML	90	--	1800	ØD	GR	3	01500	3	0	001.0	RØMANS	1	4038.2
3331.4	U	0211	RW	G	DV	LH	90	--	1800	ØD	GR	3	01500	3	0	001.2	RØMANS	1	4038.3
4331.4	U	0211	RW	G	DV	MH	90	--	1800	ØD	GR	3	01500	3	0	001.2	RØMANS	1	4038.4
1344.3	T	0211	RW	G	SØ	LL	90	--	1800	ØD	GR	3	01500	3	0	002.7	RØMANS	1	4039.1
2344.3	T	0211	RW	G	SØ	ML	90	--	1800	ØD	GR	3	01500	3	0	003.5	RØMANS	1	4039.2
3344.3	T	0211	RW	G	SØ	LH	90	--	1800	ØD	GR	3	01500	3	0	001.8	RØMANS	1	4039.3
4344.3	T	0211	RW	G	SØ	MH	90	--	1800	ØD	GR	3	01500	3	1	002.0	RØMANS	1	4039.4
1332.4	U	0211	RW	G	SØ	LL	90	--	1800	ØD	GR	3	01500	3	0	001.9	RØMANS	1	4040.1

2332.4	U	0211	RW	G	SØ	ML	90	--	1800	ØD	GR	3	01500	3	0	001.4	RØMANS	1	4040.2
3332.4	U	0211	RW	G	SØ	LH	90	--	1800	ØD	GR	3	01500	3	0	001.3	RØMANS	1	4040.3
4332.4	U	0211	RW	G	SØ	MH	90	--	1800	ØD	GR	3	01500	3	0	001.4	RØMANS	1	4040.4
1345.4	T	0211	RW	G	EØ	LL	90	--	1800	ØD	GR	3	01500	3	0	004.5	SEARS	1	4041.1
2345.4	T	0211	RW	G	EØ	ML	90	--	1800	ØD	GR	3	01500	3	0	001.7	SEARS	1	4041.2
3345.4	T	0211	RW	G	EØ	LH	90	--	1800	ØD	GR	3	01500	3	0	001.6	SEARS	1	4041.3
4345.4	T	0211	RW	G	EØ	MH	90	--	1800	ØD	GR	3	01500	3	0	001.5	SEARS	1	4041.4
1333.3	U	0211	RW	G	EØ	LL	90	--	1800	ØD	GR	3	01500	3	0	004.6	RØMANS	1	4042.1
2333.3	U	0211	RW	G	EØ	ML	90	--	1800	ØD	GR	3	01500	3	0	006.7	RØMANS	1	4042.2
3333.3	U	0211	RW	G	EØ	LH	90	--	1800	ØD	GR	3	01500	3	0	003.5	RØMANS	1	4042.3
4333.3	U	0211	RW	G	EØ	MH	90	--	1800	ØD	GR	3	01500	3	0	017.6	RØMANS	1	4042.4
1346.4	T	0211	RW	G	DV	LL	90	--	1800	ØD	GR	3	02850	3	0	001.7	RØMANS	1	4043.1
2346.4	T	0211	RW	G	DV	ML	90	--	1800	ØD	GR	3	02850	3	0	001.6	RØMANS	1	4043.2
3346.4	T	0211	RW	G	DV	LH	90	--	1800	ØD	GR	3	02850	3	0	001.2	RØMANS	1	4043.3
4346.4	T	0211	RW	G	DV	MH	90	--	1800	ØD	GR	3	02850	3	0	002.1	RØMANS	1	4043.4
1334.3	U	0211	RW	G	DV	LL	90	--	1800	ØD	GR	3	02850	3	0	003.8	RØMANS	1	4044.1
2334.3	U	0211	RW	G	DV	ML	90	--	1800	ØD	GR	3	02850	3	0	006.9	RØMANS	1	4044.2
3334.3	U	0211	RW	G	DV	LH	90	--	1800	ØD	GR	3	02850	3	0	010.9	RØMANS	1	4044.3
4334.3	U	0211	RW	G	DV	MH	90	--	1800	ØD	GR	3	02850	3	0	003.4	RØMANS	1	4044.4
1347.4	T	0211	RW	G	SØ	LL	90	--	1800	ØD	GR	3	02850	3	0	003.0	SEARS	1	4045.1
2347.4	T	0211	RW	G	SØ	ML	90	--	1800	ØD	GR	3	02850	3	0	004.4	SEARS	1	4045.2
3347.4	T	0211	RW	G	SØ	LH	90	--	1800	ØD	GR	3	02850	3	0	001.5	SEARS	1	4045.3
4347.4	T	0211	RW	G	SØ	MH	90	--	1800	ØD	GR	3	02850	3	0	031.5	SEARS	8	4045.4
1335.3	U	0211	RW	G	SØ	LL	90	--	1800	ØD	GR	3	02850	3	0	003.1	RØMANS	9	4046.1
2335.3	U	0211	RW	G	SØ	ML	90	--	1800	ØD	GR	3	02850	3	0	003.1	RØMANS	9	4046.2
3335.3	U	0211	RW	G	SØ	LH	90	--	1800	ØD	GR	3	02850	3	0	003.5	RØMANS	9	4046.3
4335.3	U	0211	RW	G	SØ	MH	90	--	1800	ØD	GR	3	02850	3	0	003.4	RØMANS	9	4046.4
1348.3	T	0211	RW	G	EØ	LL	90	--	1800	ØD	GR	3	02850	3	0	003.1	RØMANS	1	4047.1
2348.3	T	0211	RW	G	EØ	ML	90	--	1800	ØD	GR	3	02850	3	0	002.7	RØMANS	1	4047.2
3348.3	T	0211	RW	G	EØ	LH	90	--	1800	ØD	GR	3	02850	3	0	001.7	RØMANS	1	4047.3
4348.3	T	0211	RW	G	EØ	MH	90	--	1800	ØD	GR	3	02850	3	0	004.2	RØMANS	1	4047.4
1336.3	U	0211	RW	G	EØ	LL	90	--	1800	ØD	GR	3	02850	3	0	002.7	RØMANS	1	4048.1
2336.3	U	0211	RW	G	EØ	ML	90	--	1800	ØD	GR	3	02850	3	0	002.1	RØMANS	1	4048.2
3336.3	U	0211	RW	G	EØ	LH	90	--	1800	ØD	GR	3	02850	3	0	001.7	RØMANS	1	4048.3
4336.3	U	0211	RW	G	EØ	MH	90	--	1800	ØD	GR	3	02850	0	3	002.5	RØMANS	A	4048.4
1351.3	T	0212	RW	G	DV	LL	90	--	1800	ØD	GR	3	04200	3	0	015.8	RØMANS	1	4049.1
2351.3	T	0212	RW	G	DV	ML	90	--	1800	ØD	GR	3	04200	3	0	006.4	RØMANS	1	4049.2
3351.3	T	0212	RW	G	DV	LH	90	--	1800	ØD	GR	3	04200	3	0	001.6	RØMANS	1	4049.3
4351.3	T	0212	RW	G	DV	MH	90	--	1800	ØD	GR	3	04200	3	0	008.2	RØMANS	1	4049.4
1403.4	U	0212	RW	G	DV	LL	90	--	1800	ØD	GR	3	04200	3	0	004.2	SEARS	1	4050.1
2403.4	U	0212	RW	G	DV	ML	90	--	1800	ØD	GR	3	04200	3	0	007.7	SEARS	1	4050.2
3403.4	U	0212	RW	G	DV	LH	90	--	1800	ØD	GR	3	04200	3	0	007.0	SEARS	1	4050.3
4403.4	U	0212	RW	G	DV	MH	90	--	1800	ØD	GR	3	04200	2	0	037.7	SEARS	1	4050.4
1352.3	T	0212	RW	G	SØ	LL	90	--	1800	ØD	GR	3	04200	3	0	002.0	SEARS	1	4051.1
2352.3	T	0212	RW	G	SØ	ML	90	--	1800	ØD	GR	3	04200	3	0	001.7	SEARS	1	4051.2
3352.3	T	0212	RW	G	SØ	LH	90	--	1800	ØD	GR	3	04200	3	0	002.6	SEARS	1	4051.3
4352.3	T	0212	RW	G	SØ	MH	90	--	1800	ØD	GR	3	04200	3	0	032.6	SEARS	9	4051.4
1349.3	U	0212	RW	G	SØ	LL	90	--	1800	ØD	GR	3	04200	3	0	002.8	RØMANS	1	4052.1
2349.3	U	0212	RW	G	SØ	ML	90	--	1800	ØD	GR	3	04200	3	0	004.5	RØMANS	1	4052.2
3349.3	U	0212	RW	G	SØ	LH	90	--	1800	ØD	GR	3	04200	3	0	012.6	RØMANS	9	4052.3
4349.3	U	0212	RW	G	SØ	MH	90	--	1800	ØD	GR	3	04200	3	0	012.2	RØMANS	9	4052.4
1353.6	T	0212	RW	G	EØ	LL	90	--	1800	ØD	GR	3	04200	3	0	005.2	RØMANS	1	4053.1
2353.6	T	0212	RW	G	EØ	ML	90	--	1800	ØD	GR	3	04200	3	0	003.1	RØMANS	1	4053.2

3353.6	T	0212	RW	G	EØ	LH	90	--	1800	ØD	GR	3	04200	3	0	005.0	RØMANS	1	4053.3
4353.6	T	0212	RW	G	EØ	MH	90	--	1800	ØD	GR	3	04200	3	0	007.4	RØMANS	1	4053.4
1350.3	U	0212	RW	G	EØ	LL	90	--	1800	ØD	GR	3	04200	3	0	003.6	SEARS	1	4054.1
2350.3	U	0212	RW	G	EØ	ML	90	--	1800	ØD	GR	3	04200	3	0	006.4	SEARS	1	4054.2
3350.3	U	0212	RW	G	EØ	LH	90	--	1800	ØD	GR	3	04200	3	0	031.2	SEARS	1	4054.3
4350.3	U	0212	RW	G	EØ	MH	90	--	1800	ØD	GR	3	04200	3	0	041.7	SEARS	6	4054.4
1437.3	T	0220	RW	H	DV	ML	90	--	0800	ØD	GR	3	01500	3	0	001.4	SEARS	1	4055.1
2437.3	T	0220	RW	H	DV	LH	90	--	0800	ØD	GR	3	01500	3	0	001.1	SEARS	1	4055.2
3437.3	T	0220	RW	H	DV	MH	90	--	0800	ØD	GR	3	01500	2	0	001.4	SEARS	1	4055.3
4437.3	T	0220	RW	H	DV	LL	90	--	0800	ØD	GR	3	01500	3	0	001.2	SEARS	1	4055.4
1410.3	U	0219	RW	H	DV	ML	90	--	0800	ØD	GR	3	01500	3	0	001.7	SEARS	1	4056.1
2410.3	U	0219	RW	H	DV	LH	90	--	0800	ØD	GR	3	01500	3	0	001.3	SEARS	1	4056.2
3410.3	U	0219	RW	H	DV	MH	90	--	0800	ØD	GR	3	01500	0	3	000.5	SEARS	N	4056.3
4410.3	U	0219	RW	H	DV	LL	90	--	0800	ØD	GR	3	01500	3	0	001.2	SEARS	1	4056.4
1438.4	T	0220	RW	H	SØ	ML	90	--	0800	ØD	GR	3	01500	3	0	003.0	RØMANS	1	4057.1
2438.4	T	0220	RW	H	SØ	LH	90	--	0800	ØD	GR	3	01500	3	0	001.5	RØMANS	1	4057.2
3438.4	T	0220	RW	H	SØ	MH	90	--	0800	ØD	GR	3	01500	3	0	001.6	RØMANS	1	4057.3
4438.4	T	0220	RW	H	SØ	LL	90	--	0800	ØD	GR	3	01500	3	0	001.8	RØMANS	1	4057.4
1411.4	U	0219	RW	H	SØ	ML	90	--	0800	ØD	GR	3	01500	3	0	002.8	SEARS	1	4058.1
2411.4	U	0219	RW	H	SØ	LH	90	--	0800	ØD	GR	3	01500	3	0	001.2	SEARS	1	4058.2
3411.4	U	0219	RW	H	SØ	MH	90	--	0800	ØD	GR	3	01500	3	0	002.5	SEARS	1	4058.3
4411.4	U	0219	RW	H	SØ	LL	90	--	0800	ØD	GR	3	01500	3	0	001.6	SEARS	1	4058.4
1439.4	T	0220	RW	H	EØ	ML	90	--	0800	ØD	GR	3	01500	3	0	004.6	SEARS	1	4059.1
2439.4	T	0220	RW	H	EØ	LH	90	--	0800	ØD	GR	3	01500	3	0	006.8	SEARS	1	4059.2
3439.4	T	0220	RW	H	EØ	MH	90	--	0800	ØD	GR	3	01500	3	0	008.0	SEARS	1	4059.3
4439.4	T	0220	RW	H	EØ	LL	90	--	0800	ØD	GR	3	01500	3	0	002.6	SEARS	1	4059.4
1412.4	U	0219	RW	H	EØ	ML	90	--	0800	ØD	GR	3	01500	3	0	004.4	SEARS	1	4060.1
2412.4	U	0219	RW	H	EØ	LH	90	--	0800	ØD	GR	3	01500	3	0	002.4	SEARS	1	4060.2
3412.4	U	0219	RW	H	EØ	MH	90	--	0800	ØD	GR	3	01500	3	0	002.0	SEARS	1	4060.3
4412.4	U	0219	RW	H	EØ	LL	90	--	0800	ØD	GR	3	01500	3	0	001.1	SEARS	1	4060.4
1440.4	T	0220	RW	H	DV	ML	90	--	0800	ØD	GR	3	02850	3	0	004.5	RØMANS	1	4061.1
2440.4	T	0220	RW	H	DV	LH	90	--	0800	ØD	GR	3	02850	3	0	002.0	RØMANS	1	4061.2
3440.4	T	0220	RW	H	DV	MH	90	--	0800	ØD	GR	3	02850	0	0	001.6	RØMANS	N	4061.3
4440.4	T	0220	RW	H	DV	LL	90	--	0800	ØD	GR	3	02850	3	0	001.0	RØMANS	1	4061.4
1413.3	U	0219	RW	H	DV	ML	90	--	0800	ØD	GR	3	02850	3	0	003.9	SEARS	1	4062.1
2413.3	U	0219	RW	H	DV	LH	90	--	0800	ØD	GR	3	02850	3	0	005.0	SEARS	1	4062.2
3413.3	U	0219	RW	H	DV	MH	90	--	0800	ØD	GR	3	02850	3	0	016.5	SEARS	1	4062.3
4413.3	U	0219	RW	H	DV	LL	90	--	0800	ØD	GR	3	02850	3	0	001.9	SEARS	1	4062.4
1441.4	T	0220	RW	H	SØ	ML	90	--	0800	ØD	GR	3	02850	3	0	028.0	SEARS	9	4063.1
2441.4	T	0220	RW	H	SØ	LH	90	--	0800	ØD	GR	3	02850	3	0	012.8	SEARS	1	4063.2
3441.4	T	0220	RW	H	SØ	MH	90	--	0800	ØD	GR	3	02850	3	0	018.2	SEARS	9	4063.3
4441.4	T	0220	RW	H	SØ	LL	90	--	0800	ØD	GR	3	02850	3	0	030.0	SEARS	9	4063.4
1414.3	U	0219	RW	H	SØ	ML	90	--	0800	ØD	GR	3	02850	0	0	060.0	SEARS	9	4064.1
2414.3	U	0219	RW	H	SØ	LH	90	--	0800	ØD	GR	3	02850	3	0	016.0	SEARS	9	4064.2
3414.3	U	0219	RW	H	SØ	MH	90	--	0800	ØD	GR	3	02850	3	0	020.5	SEARS	9	4064.3
4414.3	U	0219	RW	H	SØ	LL	90	--	0800	ØD	GR	3	02850	3	0	016.5	SEARS	9	4064.4
1442.3	T	0220	RW	H	EØ	ML	90	--	0800	ØD	GR	3	02850	2	0	001.8	RØMANS	1	4065.1
2442.3	T	0220	RW	H	EØ	LH	90	--	0800	ØD	GR	3	02850	3	0	002.8	RØMANS	1	4065.2
3442.3	T	0220	RW	H	EØ	MH	90	--	0800	ØD	GR	3	02850	3	0	013.9	RØMANS	7	4065.3
4442.3	T	0220	RW	H	EØ	LL	90	--	0800	ØD	GR	3	02850	3	0	002.3	RØMANS	1	4065.4
1415.4	U	0219	RW	H	EØ	ML	90	--	0800	ØD	GR	3	02850	3	0	014.8	RØMANS	1	4066.1
2415.4	U	0219	RW	H	EØ	LH	90	--	0800	ØD	GR	3	02850	3	0	005.0	RØMANS	1	4066.2
3415.4	U	0219	RW	H	EØ	MH	90	--	0800	ØD	GR	3	02850	3	2	024.3	RØMANS	7	4066.3

4415.4	U	0219	RW	H	Eθ	LL	90	--	0800	θD	GR	3	02850	3	0	004.0	RθMANS	1	4066.4
1443.0	T	0220	RW	H	DV	ML	90	--	0800	θD	GR	3	04200	3	0	019.4	SEARS	1	4067.1
2443.0	T	0220	RW	H	DV	LH	90	--	0800	θD	GR	3	04200	3	0	001.5	SEARS	1	4067.2
3443.0	T	0220	RW	H	DV	MH	90	--	0800	θD	GR	3	04200	3	0	008.1	SEARS	1	4067.3
4443.0	T	0220	RW	H	DV	LL	90	--	0800	θD	GR	3	04200	3	0	035.4	SEARS	1	4067.4
1416.3	U	0219	RW	H	DV	ML	90	--	0800	θD	GR	3	04200	0	2	043.2	SEARS	1	4068.1
2416.3	U	0219	RW	H	DV	LH	90	--	0800	θD	GR	3	04200	3	0	002.5	SEARS	1	4068.2
3416.3	U	0219	RW	H	DV	MH	90	--	0800	θD	GR	3	04200	0	2	024.5	SEARS	1	4068.3
4416.3	U	0219	RW	H	DV	LL	90	--	0800	θD	GR	3	04200	3	0	003.8	SEARS	1	4068.4
1444.4	T	0220	RW	H	Sθ	ML	90	--	0800	θD	GR	3	04200	3	0	018.6	RθMANS	9	4069.1
2444.4	T	0220	RW	H	Sθ	LH	90	--	0800	θD	GR	3	04200	3	0	005.1	RθMANS	1	4069.2
3444.4	T	0220	RW	H	Sθ	MH	90	--	0800	θD	GR	3	04200	0	0	004.9	RθMANS	N	4069.3
4444.4	T	0220	RW	H	Sθ	LL	90	--	0800	θD	GR	3	04200	3	0	018.0	RθMANS	1	4069.4
1417.4	U	0219	RW	H	Sθ	ML	90	--	0800	θD	GR	3	04200	0	0	060.0	RθMANS	A	4070.1
2417.4	U	0219	RW	H	Sθ	LH	90	--	0800	θD	GR	3	04200	3	0	002.9	RθMANS	1	4070.2
3417.4	U	0219	RW	H	Sθ	MH	90	--	0800	θD	GR	3	04200	3	0	010.5	RθMANS	9	4070.3
4417.4	U	0219	RW	H	Sθ	LL	90	--	0800	θD	GR	3	04200	3	0	023.0	RθMANS	9	4070.4
1430.4	T	0219	RW	H	Eθ	ML	90	--	0800	θD	GR	3	04200	3	0	014.5	SEARS	4	4071.1
2430.4	T	0219	RW	H	Eθ	LH	90	--	0800	θD	GR	3	04200	3	0	009.6	SEARS	4	4071.2
3430.4	T	0219	RW	H	Eθ	MH	90	--	0800	θD	GR	3	04200	0	1	013.3	SEARS	4	4071.3
4430.4	T	0219	RW	H	Eθ	LL	90	--	0800	θD	GR	3	04200	3	0	025.6	SEARS	4	4071.4
1418.3	U	0219	RW	H	Eθ	ML	90	--	0800	θD	GR	3	04200	3	0	028.6	SEARS	4	4072.1
2418.3	U	0219	RW	H	Eθ	LH	90	--	0800	θD	GR	3	04200	3	0	008.9	SEARS	4	4072.2
3418.3	U	0219	RW	H	Eθ	MH	90	--	0800	θD	GR	3	04200	0	0	060.0	SEARS	D	4072.3
4418.3	U	0219	RW	H	Eθ	LL	90	--	0800	θD	GR	3	04200	3	0	010.1	SEARS	4	4072.4
1431.4	T	0219	RW	H	DV	ML	90	--	1300	θD	GR	3	01500	3	0	002.0	RθMANS	1	4073.1
2431.4	T	0219	RW	H	DV	LH	90	--	1300	θD	GR	3	01500	3	0	001.0	RθMANS	1	4073.2
3431.4	T	0219	RW	H	DV	MH	90	--	1300	θD	GR	3	01500	2	0	002.1	RθMANS	1	4073.3
4431.4	T	0219	RW	H	DV	LL	90	--	1300	θD	GR	3	01500	3	0	001.1	RθMANS	1	4073.4
1419.3	U	0219	RW	H	DV	ML	90	--	1300	θD	GR	3	01500	3	0	003.9	RθMANS	1	4074.1
2419.3	U	0219	RW	H	DV	LH	90	--	1300	θD	GR	3	01500	3	0	001.7	RθMANS	1	4074.2
3419.3	U	0219	RW	H	DV	MH	90	--	1300	θD	GR	3	01500	2	0	002.1	RθMANS	1	4074.3
4419.3	U	0219	RW	H	DV	LL	90	--	1300	θD	GR	3	01500	3	0	003.3	RθMANS	1	4074.4
1432.3	T	0219	RW	H	Sθ	ML	90	--	1300	θD	GR	3	01500	3	0	005.1	SEARS	1	4075.1
2432.3	T	0219	RW	H	Sθ	LH	90	--	1300	θD	GR	3	01500	3	0	001.8	SEARS	1	4075.2
3432.3	T	0219	RW	H	Sθ	MH	90	--	1300	θD	GR	3	01500	3	0	002.2	SEARS	1	4075.3
4432.3	T	0219	RW	H	Sθ	LL	90	--	1300	θD	GR	3	01500	3	0	001.7	SEARS	1	4075.4
1420.3	U	0219	RW	H	Sθ	ML	90	--	1300	θD	GR	3	01500	3	0	002.4	SEARS	1	4076.1
2420.3	U	0219	RW	H	Sθ	LH	90	--	1300	θD	GR	3	01500	3	0	000.6	SEARS	1	4076.2
3420.3	U	0219	RW	H	Sθ	MH	90	--	1300	θD	GR	3	01500	3	1	003.1	SEARS	1	4076.3
4420.3	U	0219	RW	H	Sθ	LL	90	--	1300	θD	GR	3	01500	3	0	001.7	SEARS	1	4076.4
1433.0	T	0219	RW	H	Eθ	ML	90	--	1300	θD	GR	3	01500	3	0	019.6	RθMANS	4	4077.1
2433.0	T	0219	RW	H	Eθ	LH	90	--	1300	θD	GR	3	01500	3	0	002.3	RθMANS	1	4077.2
3433.0	T	0219	RW	H	Eθ	MH	90	--	1300	θD	GR	3	01500	3	0	003.2	RθMANS	1	4077.3
4433.0	T	0219	RW	H	Eθ	LL	90	--	1300	θD	GR	3	01500	3	0	001.0	RθMANS	1	4077.4
1421.3	U	0219	RW	H	Eθ	ML	90	--	1300	θD	GR	3	01500	2	0	005.8	RθMANS	1	4078.1
2421.3	U	0219	RW	H	Eθ	LH	90	--	1300	θD	GR	3	01500	3	0	006.9	RθMANS	1	4078.2
3421.3	U	0219	RW	H	Eθ	MH	90	--	1300	θD	GR	3	01500	1	0	007.7	RθMANS	1	4078.3
4421.3	U	0219	RW	H	Eθ	LL	90	--	1300	θD	GR	3	01500	3	0	002.9	RθMANS	1	4078.4
1450.3	T	0220	RW	H	DV	ML	90	--	1300	θD	GR	3	02850	3	0	009.3	SEARS	1	4079.1
2450.3	T	0220	RW	H	DV	LH	90	--	1300	θD	GR	3	02850	3	0	004.6	SEARS	1	4079.2
3450.3	T	0220	RW	H	DV	MH	90	--	1300	θD	GR	3	02850	3	0	057.2	SEARS	1	4079.3
4450.3	T	0220	RW	H	DV	LL	90	--	1300	θD	GR	3	02850	3	0	001.3	SEARS	1	4079.4

1422.4	U	0219	RW	H	DV	ML	90	--	1300	ØD	GR	3	02850	3	0	010.2	SEARS	1	4080.1
2422.4	U	0219	RW	H	DV	LH	90	--	1300	ØD	GR	3	02850	3	0	006.1	SEARS	1	4080.2
3422.4	U	0219	RW	H	DV	MH	90	--	1300	ØD	GR	3	02850	3	0	018.6	SEARS	1	4080.3
4422.4	U	0219	RW	H	DV	LL	90	--	1300	ØD	GR	3	02850	3	0	048.2	SEARS	1	4080.4
1451.3	T	0220	RW	H	SØ	ML	90	--	1300	ØD	GR	3	02850	3	0	003.7	RØMANS	1	4081.1
2451.3	T	0220	RW	H	SØ	LH	90	--	1300	ØD	GR	3	02850	3	0	002.4	RØMANS	1	4081.2
3451.3	T	0220	RW	H	SØ	MH	90	--	1300	ØD	GR	3	02850	3	0	008.1	RØMANS	9	4081.3
4451.3	T	0220	RW	H	SØ	LL	90	--	1300	ØD	GR	3	02850	3	0	003.4	RØMANS	1	4081.4
1423.4	U	0219	RW	H	SØ	ML	90	--	1300	ØD	GR	3	02850	3	0	002.0	RØMANS	1	4082.1
2423.4	U	0219	RW	H	SØ	LH	90	--	1300	ØD	GR	3	02850	3	0	001.4	RØMANS	1	4082.2
3423.4	U	0219	RW	H	SØ	MH	90	--	1300	ØD	GR	3	02850	1	0	005.1	RØMANS	1	4082.3
4423.4	U	0219	RW	H	SØ	LL	90	--	1300	ØD	GR	3	02850	0	2	017.9	RØMANS	9	4082.4
1452.4	T	0220	RW	H	EØ	ML	90	--	1300	ØD	GR	3	02850	3	0	005.6	SEARS	1	4083.1
2452.4	T	0220	RW	H	EØ	LH	90	--	1300	ØD	GR	3	02850	3	0	003.5	SEARS	1	4083.2
3452.4	T	0220	RW	H	EØ	MH	90	--	1300	ØD	GR	3	02850	3	0	003.2	SEARS	1	4083.3
4452.4	T	0220	RW	H	EØ	LL	90	--	1300	ØD	GR	3	02850	0	0	060.0	SEARS	A	4083.4
1424.3	U	0219	RW	H	EØ	ML	90	--	1300	ØD	GR	3	02850	3	0	002.1	SEARS	1	4084.1
2424.3	U	0219	RW	H	EØ	LH	90	--	1300	ØD	GR	3	02850	3	0	001.9	SEARS	1	4084.2
3424.3	U	0219	RW	H	EØ	MH	90	--	1300	ØD	GR	3	02850	0	0	012.2	SEARS	N	4084.3
4424.3	U	0219	RW	H	EØ	LL	90	--	1300	ØD	GR	3	02850	3	0	025.7	SEARS	7	4084.4
1453.3	T	0220	RW	H	DV	ML	90	--	1300	ØD	GR	3	04200	3	0	002.4	RØMANS	1	4085.1
2453.3	T	0220	RW	H	DV	LH	90	--	1300	ØD	GR	3	04200	3	0	001.4	RØMANS	1	4085.2
3453.3	T	0220	RW	H	DV	MH	90	--	1300	ØD	GR	3	04200	0	0	002.0	RØMANS	N	4085.3
4453.3	T	0220	RW	H	DV	LL	90	--	1300	ØD	GR	3	04200	3	0	002.2	RØMANS	1	4085.4
1425.3	U	0219	RW	H	DV	ML	90	--	1300	ØD	GR	3	04200	0	1	007.2	RØMANS	1	4086.1
2425.3	U	0219	RW	H	DV	LH	90	--	1300	ØD	GR	3	04200	3	0	001.6	RØMANS	1	4086.2
3425.3	U	0219	RW	H	DV	MH	90	--	1300	ØD	GR	3	04200	0	2	003.9	RØMANS	1	4086.3
4425.3	U	0219	RW	H	DV	LL	90	--	1300	ØD	GR	3	04200	3	0	002.4	RØMANS	1	4086.4
1454.4	T	0220	RW	H	SØ	ML	90	--	1300	ØD	GR	3	04200	3	0	008.9	SEARS	1	4087.1
2454.4	T	0220	RW	H	SØ	LH	90	--	1300	ØD	GR	3	04200	3	0	007.3	SEARS	1	4087.2
3454.4	T	0220	RW	H	SØ	MH	90	--	1300	ØD	GR	3	04200	3	0	020.9	SEARS	9	4087.3
4454.4	T	0220	RW	H	SØ	LL	90	--	1300	ØD	GR	3	04200	3	0	021.0	SEARS	9	4087.4
1426.4	U	0219	RW	H	SØ	ML	90	--	1300	ØD	GR	3	04200	3	0	003.5	RØMANS	A	4088.1
2426.4	U	0219	RW	H	SØ	LH	90	--	1300	ØD	GR	3	04200	3	0	003.7	RØMANS	1	4088.2
3426.4	U	0219	RW	H	SØ	MH	90	--	1300	ØD	GR	3	04200	0	3	017.2	RØMANS	9	4088.3
4426.4	U	0219	RW	H	SØ	LL	90	--	1300	ØD	GR	3	04200	3	0	005.1	RØMANS	1	4088.4
1455.4	T	0220	RW	H	EØ	ML	90	--	1300	ØD	GR	3	04200	3	0	003.4	RØMANS	1	4089.1
2455.4	T	0220	RW	H	EØ	LH	90	--	1300	ØD	GR	3	04200	3	0	003.3	RØMANS	1	4089.2
3455.4	T	0220	RW	H	EØ	MH	90	--	1300	ØD	GR	3	04200	0	0	009.6	RØMANS	N	4089.3
4455.4	T	0220	RW	H	EØ	LL	90	--	1300	ØD	GR	3	04200	3	0	060.0	RØMANS	7	4089.4
1427.3	U	0219	RW	H	EØ	ML	90	--	1300	ØD	GR	3	04200	0	0	060.0	RØMANS	D	4090.1
2427.3	U	0219	RW	H	EØ	LH	90	--	1300	ØD	GR	3	04200	3	0	036.0	RØMANS	4	4090.2
3427.3	U	0219	RW	H	EØ	MH	90	--	1300	ØD	GR	3	04200	0	0	027.6	RØMANS	N	4090.3
4427.3	U	0219	RW	H	EØ	LL	90	--	1300	ØD	GR	3	04200	3	0	018.8	RØMANS	4	4090.4
1456.4	T	0220	RW	H	DV	ML	90	--	1800	ØD	GR	3	01500	3	0	001.5	SEARS	1	4091.1
2456.4	T	0220	RW	H	DV	LH	90	--	1800	ØD	GR	3	01500	3	0	001.2	SEARS	1	4091.2
3456.4	T	0220	RW	H	DV	MH	90	--	1800	ØD	GR	3	01500	3	0	003.1	SEARS	1	4091.3
4456.4	T	0220	RW	H	DV	LL	90	--	1800	ØD	GR	3	01500	3	0	001.3	SEARS	1	4091.4
1428.3	U	0219	RW	H	DV	ML	90	--	1800	ØD	GR	3	01500	0	0	012.4	RØMANS	N	4092.1
2428.3	U	0219	RW	H	DV	LH	90	--	1800	ØD	GR	3	01500	0	0	003.8	RØMANS	N	4092.2
3428.3	U	0219	RW	H	DV	MH	90	--	1800	ØD	GR	3	01500	0	1	016.1	RØMANS	1	4092.3
4428.3	U	0219	RW	H	DV	LL	90	--	1800	ØD	GR	3	01500	3	0	014.5	RØMANS	1	4092.4
1457.4	T	0220	RW	H	SØ	ML	90	--	1800	ØD	GR	3	01500	3	0	001.6	RØMANS	1	4093.1

2457.4	T	0220	RW	H	SØ	LH	90	--	1800	ØD	GR	3	01500	3	0	001.4	RØMANS	1	4093.2
3457.4	T	0220	RW	H	SØ	MH	90	--	1800	ØD	GR	3	01500	3	0	001.9	RØMANS	1	4093.3
4457.4	T	0220	RW	H	SØ	LL	90	--	1800	ØD	GR	3	01500	3	0	001.8	RØMANS	1	4093.4
1429.3	U	0219	RW	H	SØ	ML	90	--	1800	ØD	GR	3	01500	3	0	016.1	RØMANS	1	4094.1
2429.3	U	0219	RW	H	SØ	LH	90	--	1800	ØD	GR	3	01500	3	0	004.6	RØMANS	1	4094.2
3429.3	U	0219	RW	H	SØ	MH	90	--	1800	ØD	GR	3	01500	3	0	004.1	RØMANS	1	4094.3
4429.3	U	0219	RW	H	SØ	LL	90	--	1800	ØD	GR	3	01500	0	0	060.0	RØMANS	J	4094.4
1446.0	T	0220	RW	H	EØ	ML	90	--	1800	ØD	GR	3	01500	3	0	003.6	SEARS	1	4095.1
2446.0	T	0220	RW	H	EØ	LH	90	--	1800	ØD	GR	3	01500	3	0	001.5	SEARS	1	4095.2
3446.0	T	0220	RW	H	EØ	MH	90	--	1800	ØD	GR	3	01500	3	0	001.9	SEARS	1	4095.3
4446.0	T	0220	RW	H	EØ	LL	90	--	1800	ØD	GR	3	01500	3	0	001.6	SEARS	1	4095.4
1434.4	U	0220	RW	H	EØ	ML	90	--	1800	ØD	GR	3	01500	3	0	003.1	SEARS	1	4096.1
2434.4	U	0220	RW	H	EØ	LH	90	--	1800	ØD	GR	3	01500	3	0	001.0	SEARS	1	4096.2
3434.4	U	0220	RW	H	EØ	MH	90	--	1800	ØD	GR	3	01500	3	0	001.8	SEARS	1	4096.3
4434.4	U	0220	RW	H	EØ	LL	90	--	1800	ØD	GR	3	01500	3	0	001.0	SEARS	1	4096.4
1447.4	T	0220	RW	H	DV	ML	90	--	1800	ØD	GR	3	02850	0	0	001.7	RØMANS	N	4097.1
2447.4	T	0220	RW	H	DV	LH	90	--	1800	ØD	GR	3	02850	3	0	002.0	RØMANS	1	4097.2
3447.4	T	0220	RW	H	DV	MH	90	--	1800	ØD	GR	3	02850	3	2	005.2	RØMANS	1	4097.3
4447.4	T	0220	RW	H	DV	LL	90	--	1800	ØD	GR	3	02850	3	0	003.6	RØMANS	1	4097.4
1435.3	U	0220	RW	H	DV	ML	90	--	1800	ØD	GR	3	02850	3	0	003.2	RØMANS	1	4098.1
2435.3	U	0220	RW	H	DV	LH	90	--	1800	ØD	GR	3	02850	3	0	002.8	RØMANS	1	4098.2
3435.3	U	0220	RW	H	DV	MH	90	--	1800	ØD	GR	3	02850	1	0	005.1	RØMANS	1	4098.3
4435.3	U	0220	RW	H	DV	LL	90	--	1800	ØD	GR	3	02850	3	0	002.3	RØMANS	1	4098.4
1448.3	T	0220	RW	H	SØ	ML	90	--	1800	ØD	GR	3	02850	3	0	002.7	SEARS	1	4099.1
2448.3	T	0220	RW	H	SØ	LH	90	--	1800	ØD	GR	3	02850	3	0	003.3	SEARS	1	4099.2
3448.3	T	0220	RW	H	SØ	MH	90	--	1800	ØD	GR	3	02850	3	0	002.0	SEARS	1	4099.3
4448.3	T	0220	RW	H	SØ	LL	90	--	1800	ØD	GR	3	02850	3	0	001.2	SEARS	1	4099.4
1436.4	U	0220	RW	H	SØ	ML	90	--	1800	ØD	GR	3	02850	3	0	006.9	SEARS	9	4100.1
2436.4	U	0220	RW	H	SØ	LH	90	--	1800	ØD	GR	3	02850	3	0	005.9	SEARS	1	4100.2
3436.4	U	0220	RW	H	SØ	MH	90	--	1800	ØD	GR	3	02850	3	0	016.2	SEARS	9	4100.3
4436.4	U	0220	RW	H	SØ	LL	90	--	1800	ØD	GR	3	02850	3	0	046.8	SEARS	9	4100.4
1449.3	T	0220	RW	H	EØ	ML	90	--	1800	ØD	GR	3	02850	3	0	002.6	RØMANS	1	4101.1
2449.3	T	0220	RW	H	EØ	LH	90	--	1800	ØD	GR	3	02850	3	0	002.5	RØMANS	1	4101.2
3449.3	T	0220	RW	H	EØ	MH	90	--	1800	ØD	GR	3	02850	3	0	027.2	RØMANS	7	4101.3
4449.3	T	0220	RW	H	EØ	LL	90	--	1800	ØD	GR	3	02850	3	0	002.1	RØMANS	1	4101.4
1445.3	U	0220	RW	H	EØ	ML	90	--	1800	ØD	GR	3	02850	3	0	007.8	RØMANS	1	4102.1
2445.3	U	0220	RW	H	EØ	LH	90	--	1800	ØD	GR	3	02850	3	0	002.9	RØMANS	1	4102.2
3445.3	U	0220	RW	H	EØ	MH	90	--	1800	ØD	GR	3	02850	3	0	008.3	RØMANS	1	4102.3
4445.3	U	0220	RW	H	EØ	LL	90	--	1800	ØD	GR	3	02850	3	0	002.1	RØMANS	1	4102.4
1463.3	T	0221	RW	H	DV	ML	90	--	1800	ØD	GR	3	04200	1	2	015.8	RØMANS	1	4103.1
2463.3	T	0221	RW	H	DV	LH	90	--	1800	ØD	GR	3	04200	3	0	001.7	RØMANS	1	4103.2
3463.3	T	0221	RW	H	DV	MH	90	--	1800	ØD	GR	3	04200	0	0	033.6	RØMANS	N	4103.3
4463.3	T	0221	RW	H	DV	LL	90	--	1800	ØD	GR	3	04200	3	0	002.9	RØMANS	1	4103.4
1458.3	U	0221	RW	H	DV	ML	90	--	1800	ØD	GR	3	04200	3	0	008.5	SEARS	1	4104.1
2458.3	U	0221	RW	H	DV	LH	90	--	1800	ØD	GR	3	04200	3	0	010.5	SEARS	1	4104.2
3458.3	U	0221	RW	H	DV	MH	90	--	1800	ØD	GR	3	04200	0	0	060.0	SEARS	1	4104.3
4458.3	U	0221	RW	H	DV	LL	90	--	1800	ØD	GR	3	04200	0	1	054.6	SEARS	1	4104.4
1461.0	T	0221	RW	H	SØ	ML	90	--	1800	ØD	GR	3	04200	3	0	003.8	SEARS	1	4105.1
2461.0	T	0221	RW	H	SØ	LH	90	--	1800	ØD	GR	3	04200	3	0	001.4	SEARS	1	4105.2
3461.0	T	0221	RW	H	SØ	MH	90	--	1800	ØD	GR	3	04200	3	0	003.8	SEARS	1	4105.3
4461.0	T	0221	RW	H	SØ	LL	90	--	1800	ØD	GR	3	04200	0	1	017.1	SEARS	9	4105.4
1459.4	U	0221	RW	H	SØ	ML	90	--	1800	ØD	GR	3	04200	3	0	005.5	RØMANS	1	4106.1
2459.4	U	0221	RW	H	SØ	LH	90	--	1800	ØD	GR	3	04200	3	0	006.2	RØMANS	1	41[illegible]

3459.4	U	0221	RW	H	SO	MH	90	--	1800	OD	GR	3	04200	0	0	060.0	ROMANS	A	4106.3
4459.4	U	0221	RW	H	SO	LL	90	--	1800	OD	GR	3	04200	3	0	004.4	ROMANS	1	4106.4
1462.3	T	0221	RW	H	EO	ML	90	--	1800	OD	GR	3	04200	3	0	006.6	ROMANS	1	4107.1
2462.3	T	0221	RW	H	EO	LH	90	--	1800	OD	GR	3	04200	3	0	014.3	ROMANS	1	4107.2
3462.3	T	0221	RW	H	EO	MH	90	--	1800	OD	GR	3	04200	2	0	007.6	ROMANS	1	4107.3
4462.3	T	0221	RW	H	EO	LL	90	--	1800	OD	GR	3	04200	3	0	021.1	ROMANS	7	4107.4
1460.3	U	0221	RW	H	EO	ML	90	--	1800	OD	GR	3	04200	0	0	060.0	SEARS	G	4108.1
2460.3	U	0221	RW	H	EO	LH	90	--	1800	OD	GR	3	04200	3	0	007.1	SEARS	1	4108.2
3460.3	U	0221	RW	H	EO	MH	90	--	1800	OD	GR	3	04200	0	2	051.2	SEARS	7	4108.3
4460.3	U	0221	RW	H	EO	LL	90	--	1800	OD	GR	3	04200	3	0	007.2	SEARS	1	4108.4
1366.3	T	0213	RW	I	DV	LH	90	--	0800	OD	GR	3	01500	3	0	002.8	ROMANS	1	4109.1
2366.3	T	0213	RW	I	DV	MH	90	--	0800	OD	GR	3	01500	3	0	007.1	ROMANS	1	4109.2
3366.3	T	0213	RW	I	DV	LL	90	--	0800	OD	GR	3	01500	3	0	007.5	ROMANS	1	4109.3
4366.3	T	0213	RW	I	DV	ML	90	--	0800	OD	GR	3	01500	3	0	016.6	ROMANS	1	4109.4
1354.0	U	0213	RW	I	DV	LH	90	--	0800	OD	GR	3	01500	3	0	001.5	ROMANS	1	4110.1
2354.0	U	0213	RW	I	DV	MH	90	--	0800	OD	GR	3	01500	3	0	002.4	ROMANS	1	4110.2
3354.0	U	0213	RW	I	DV	LL	90	--	0800	OD	GR	3	01500	3	0	002.2	ROMANS	1	4110.3
1367.3	T	0213	RW	I	SO	LH	90	--	0800	OD	GR	3	01500	3	0	001.9	SEARS	1	4111.1
4354.0	U	0213	RW	I	DV	ML	90	--	0800	OD	GR	3	01500	3	0	004.9	ROMANS	1	4110.4
2367.3	T	0213	RW	I	SO	MH	90	--	0800	OD	GR	3	01500	3	0	003.8	SEARS	1	4111.2
3367.3	T	0213	RW	I	SO	LL	90	--	0800	OD	GR	3	01500	3	0	001.2	SEARS	1	4111.3
4367.3	T	0213	RW	I	SO	ML	90	--	0800	OD	GR	3	01500	3	0	001.2	SEARS	1	4111.4
1355.3	U	0213	RW	I	SO	LH	90	--	0800	OD	GR	3	01500	3	0	003.6	SEARS	1	4112.1
2355.3	U	0213	RW	I	SO	MH	90	--	0800	OD	GR	3	01500	3	0	006.3	SEARS	1	4112.2
3355.3	U	0213	RW	I	SO	LL	90	--	0800	OD	GR	3	01500	3	0	001.2	SEARS	1	4112.3
4355.3	U	0213	RW	I	SO	ML	90	--	0800	OD	GR	3	01500	3	0	001.0	SEARS	1	4112.4
1368.3	T	0213	RW	I	EO	LH	90	--	0800	OD	GR	3	01500	3	0	002.6	ROMANS	1	4113.1
2368.3	T	0213	RW	I	EO	MH	90	--	0800	OD	GR	3	01500	3	0	002.6	ROMANS	1	4113.2
3368.3	T	0213	RW	I	EO	LL	90	--	0800	OD	GR	3	01500	3	0	002.2	ROMANS	1	4113.3
4368.3	T	0213	RW	I	EO	ML	90	--	0800	OD	GR	3	01500	0	0	002.0	ROMANS	N	4113.4
1356.3	U	0213	RW	I	EO	LH	90	--	0800	OD	GR	3	01500	3	0	006.4	ROMANS	1	4114.1
2356.3	U	0213	RW	I	EO	MH	90	--	0800	OD	GR	3	01500	3	0	003.1	ROMANS	1	4114.2
3356.3	U	0213	RW	I	EO	LL	90	--	0800	OD	GR	3	01500	3	0	001.2	ROMANS	1	4114.3
4356.3	U	0213	RW	I	EO	ML	90	--	0800	OD	GR	3	01500	3	0	002.7	ROMANS	1	4114.4
1369.3	T	0213	RW	I	DV	LH	90	--	0800	OD	GR	3	02850	3	0	015.3	SEARS	1	4115.1
2369.3	T	0213	RW	I	DV	MH	90	--	0800	OD	GR	3	02850	3	0	002.5	SEARS	1	4115.2
3369.3	T	0213	RW	I	DV	LL	90	--	0800	OD	GR	3	02850	3	0	001.9	SEARS	1	4115.3
4369.3	T	0213	RW	I	DV	ML	90	--	0800	OD	GR	3	02850	3	0	002.2	SEARS	1	4115.4
1357.3	U	0213	RW	I	DV	LH	90	--	0800	OD	GR	3	02850	3	0	002.8	SEARS	1	4116.1
2357.3	U	0213	RW	I	DV	MH	90	--	0800	OD	GR	3	02850	3	0	005.3	SEARS	1	4116.2
3357.3	U	0213	RW	I	DV	LL	90	--	0800	OD	GR	3	02850	3	0	002.0	SEARS	1	4116.3
4357.3	U	0213	RW	I	DV	ML	90	--	0800	OD	GR	3	02850	3	0	004.3	SEARS	1	4116.4
1370.3	T	0213	RW	I	SO	LH	90	--	0800	OD	GR	3	02850	3	0	001.8	ROMANS	1	4117.1
2370.3	T	0213	RW	I	SO	MH	90	--	0800	OD	GR	3	02850	3	0	007.3	ROMANS	1	4117.2
3370.3	T	0213	RW	I	SO	LL	90	--	0800	OD	GR	3	02850	3	0	005.4	ROMANS	1	4117.3
4370.3	T	0213	RW	I	SO	ML	90	--	0800	OD	GR	3	02850	3	0	007.9	ROMANS	1	4117.4
1358.3	U	0213	RW	I	SO	LH	90	--	0800	OD	GR	3	02850	3	0	001.6	ROMANS	1	4118.1
2358.3	U	0213	RW	I	SO	MH	90	--	0800	OD	GR	3	02850	3	0	014.7	ROMANS	9	4118.2
3358.3	U	0213	RW	I	SO	LL	90	--	0800	OD	GR	3	02850	3	0	001.7	ROMANS	1	4118.3
4358.3	U	0213	RW	I	SO	ML	90	--	0800	OD	GR	3	02850	0	0	006.1	ROMANS	N	4118.4
1371.3	T	0213	RW	I	EO	LH	90	--	0800	OD	GR	3	02850	3	0	002.3	SEARS	1	4119.1
2371.3	T	0213	RW	I	EO	MH	90	--	0800	OD	GR	3	02850	3	0	004.9	SEARS	1	4119.2
3371.3	T	0213	RW	I	EO	LL	90	--	0800	OD	GR	3	02850	3	0	001.7	SEARS	1	4119.3

4371.3	T	0213	RW	I	EØ	ML	90	--	0800	ØD	GR	3	02850	3	0	002.8	SEARS	1	4119.4
1359.3	U	0213	RW	I	EØ	LH	90	--	0800	ØD	GR	3	02850	3	0	012.1	SEARS	1	4120.1
2359.3	U	0213	RW	I	EØ	MH	90	--	0800	ØD	GR	3	02850	3	0	002.6	SEARS	1	4120.2
3359.3	U	0213	RW	I	EØ	LL	90	--	0800	ØD	GR	3	02850	3	0	001.2	SEARS	1	4120.3
4359.3	U	0213	RW	I	EØ	ML	90	--	0800	ØD	GR	3	02850	2	0	008.5	SEARS	1	4120.4
1372.3	T	0213	RW	I	DV	LH	90	--	0800	ØD	GR	3	04200	3	0	002.3	RØMANS	1	4121.1
2372.3	T	0213	RW	I	DV	M	90	--	0800	ØD	GR	3	04200	1	0	004.6	RØMANS	1	4121.2
3372.3	T	0213	RW	I	DV	L	90	--	0800	ØD	GR	3	04200	3	0	001.4	RØMANS	1	4121.3
4372.3	T	0213	RW	I	DV	M	90	--	0800	ØD	GR	3	04200	3	0	002.4	RØMANS	1	4121.4
1360.3	U	0213	RW	I	DV	LH	90	--	0800	ØD	GR	3	04200	3	0	010.2	RØMANS	1	4122.1
2360.3	U	0213	RW	I	DV	MH	90	--	0800	ØD	GR	3	04200	2	0	003.8	RØMANS	1	4122.2
3360.3	U	0213	RW	I	DV	LL	90	--	0800	ØD	GR	3	04200	3	0	002.1	RØMANS	1	4122.3
4360.3	U	0213	RW	I	DV	ML	90	--	0800	ØD	GR	3	04200	0	1	004.9	RØMANS	1	4122.4
1373.4	T	0213	RW	I	SØ	L	90	--	0800	ØD	GR	3	04200	3	0	007.2	SEARS	1	4123.1
2373.4	T	0213	RW	I	SØ	M	90	--	0800	ØD	GR	3	04200	0	2	017.3	SEARS	1	4123.2
3373.4	T	0213	RW	I	SØ	L	90	--	0800	ØD	GR	3	04200	3	0	002.4	SEARS	1	4123.3
4373.4	T	0213	RW	I	SØ	M	90	--	0800	ØD	GR	3	04200	3	0	003.1	SEARS	1	4123.4
1361.3	U	0213	RW	I	SØ	LH	90	--	0800	ØD	GR	3	04200	3	0	006.2	SEARS	1	4124.1
2361.3	U	0213	RW	I	SØ	MH	90	--	0800	ØD	GR	3	04200	3	2	005.6	SEARS	1	4124.2
3361.3	U	0213	RW	I	SØ	LL	90	--	0800	ØD	GR	3	04200	3	0	004.1	SEARS	1	4124.3
4361.3	U	0213	RW	I	SØ	ML	90	--	0800	ØD	GR	3	04200	0	0	060.0	SEARS	J	4124.4
1374.0	T	0213	RW	I	EØ	L	90	--	0800	ØD	GR	3	04200	3	0	014.4	RØMANS	1	4125.1
2374.0	T	0213	RW	I	EØ	M	90	--	0800	ØD	GR	3	04200	3	1	031.7	RØMANS	1	4125.2
3374.0	T	0213	RW	I	EØ	L	90	--	0800	ØD	GR	3	04200	3	1	002.4	RØMANS	1	4125.3
4374.0	T	0213	RW	I	EØ	M	90	--	0800	ØD	GR	3	04200	0	3	045.6	RØMANS	1	4125.4
1362.3	U	0213	RW	I	EØ	LH	90	--	0800	ØD	GR	3	04200	3	0	006.8	RØMANS	1	4126.1
2362.3	U	0213	RW	I	EØ	MH	90	--	0800	ØD	GR	3	04200	3	0	019.6	RØMANS	7	4126.2
3362.3	U	0213	RW	I	EØ	LL	90	--	0800	ØD	GR	3	04200	3	0	008.2	RØMANS	1	4126.3
4362.3	U	0213	RW	I	EØ	ML	90	--	0800	ØD	GR	3	04200	3	0	048.1	RØMANS	7	4126.4
1375.4	T	0213	RW	I	DV	LH	90	--	1300	ØD	GR	3	01500	3	0	001.6	SEARS	1	4127.1
2375.4	T	0213	RW	I	DV	MH	90	--	1300	ØD	GR	3	01500	3	0	002.3	SEARS	1	4127.2
3375.4	T	0213	RW	I	DV	LL	90	--	1300	ØD	GR	3	01500	3	0	001.1	SEARS	1	4127.3
4375.4	T	0213	RW	I	DV	ML	90	--	1300	ØD	GR	3	01500	3	0	001.2	SEARS	1	4127.4
1363.3	U	0213	RW	I	DV	LH	90	--	1300	ØD	GR	3	01500	3	0	001.1	SEARS	1	4128.1
2363.3	U	0213	RW	I	DV	MH	90	--	1300	ØD	GR	3	01500	3	0	002.2	SEARS	1	4128.2
3363.3	U	0213	RW	I	DV	LL	90	--	1300	ØD	GR	3	01500	3	0	001.0	SEARS	1	4128.3
4363.3	U	0213	RW	I	DV	ML	90	--	1300	ØD	GR	3	01500	3	0	001.2	SEARS	1	4128.4
1376.4	T	0213	RW	I	SØ	LH	90	--	1300	ØD	GR	3	01500	3	0	001.6	RØMANS	1	4129.1
2376.4	T	0213	RW	I	SØ	MH	90	--	1300	ØD	GR	3	01500	3	0	001.6	RØMANS	1	4129.2
3376.4	T	0213	RW	I	SØ	LL	90	--	1300	ØD	GR	3	01500	3	0	001.1	RØMANS	1	4129.3
4376.4	T	0213	RW	I	SØ	ML	90	--	1300	ØD	GR	3	01500	3	0	005.6	RØMANS	1	4129.4
1364.3	U	0213	RW	I	SØ	LH	90	--	1300	ØD	GR	3	01500	3	0	002.2	RØMANS	1	4130.1
2364.3	U	0213	RW	I	SØ	MH	90	--	1300	ØD	GR	3	01500	3	0	001.8	RØMANS	1	4130.2
3364.3	U	0213	RW	I	SØ	LL	90	--	1300	ØD	GR	3	01500	3	0	001.3	RØMANS	1	4130.3
4364.3	U	0213	RW	I	SØ	ML	90	--	1300	ØD	GR	3	01500	3	0	001.3	RØMANS	1	4130.4
1377.4	T	0213	RW	I	EØ	LH	90	--	1300	ØD	GR	3	01500	3	0	001.7	SEARS	1	4131.1
2377.4	T	0213	RW	I	EØ	MH	90	--	1300	ØD	GR	3	01500	3	0	001.8	SEARS	1	4131.2
3377.4	T	0213	RW	I	EØ	LL	90	--	1300	ØD	GR	3	01500	3	0	003.3	SEARS	1	4131.3
4377.4	T	0213	RW	I	EØ	ML	90	--	1300	ØD	GR	3	01500	3	0	002.4	SEARS	1	4131.4
1365.3	U	0213	RW	I	EØ	LH	90	--	1300	ØD	GR	3	01500	3	0	002.3	SEARS	1	4132.1
2365.3	U	0213	RW	I	EØ	MH	90	--	1300	ØD	GR	3	01500	0	0	060.[illegible]	SEARS	[illegible]	4132.2
3365.3	U	0213	RW	I	EØ	LL	90	--	1300	ØD	GR	3	01500	3	0	002.1	SEARS	1	4132.3
4365.3	U	0213	RW	I	EØ	ML	90	--	1300	ØD	GR	3	01500	3	0	034.4	SEARS	6	4132.4

1390.4	T	0214	RW	I	DV	LH	90	--	1300	ØD	GR	3	02850	3	0	001.3	SEARS	1	4133.1
2390.4	T	0214	RW	I	DV	MH	90	--	1300	ØD	GR	3	02850	2	0	004.5	SEARS	1	4133.2
3390.4	T	0214	RW	I	DV	LL	90	--	1300	ØD	GR	3	02850	3	0	001.5	SEARS	1	4133.3
4390.4	T	0214	RW	I	DV	ML	90	--	1300	ØD	GR	3	02850	3	0	002.6	SEARS	1	4133.4
1378.0	U	0214	RW	I	DV	LH	90	--	1300	ØD	GR	3	02850	3	0	001.7	SEARS	1	4134.1
2378.0	U	0214	RW	I	DV	MH	90	--	1300	ØD	GR	3	02850	0	1	027.0	SEARS	1	4134.2
3378.0	U	0214	RW	I	DV	LL	90	--	1300	ØD	GR	3	02850	3	0	002.1	SEARS	1	4134.3
4378.0	U	0214	RW	I	DV	ML	90	--	1300	ØD	GR	3	02850	3	0	002.3	SEARS	1	4134.4
1391.4	T	0214	RW	I	SØ	LH	90	--	1300	ØD	GR	3	02850	3	0	001.6	RØMANS	1	4135.1
2391.4	T	0214	RW	I	SØ	MH	90	--	1300	ØD	GR	3	02850	2	0	002.4	RØMANS	1	4135.2
3391.4	T	0214	RW	I	SØ	LL	90	--	1300	ØD	GR	3	02850	3	0	001.2	RØMANS	1	4135.3
4391.4	T	0214	RW	I	SØ	ML	90	--	1300	ØD	GR	3	02850	3	0	001.3	RØMANS	1	4135.4
1379.3	U	0214	RW	I	SØ	LH	90	--	1300	ØD	GR	3	02850	3	0	003.4	RØMANS	1	4136.1
2379.3	U	0214	RW	I	SØ	MH	90	--	1300	ØD	GR	3	02850	3	0	007.4	RØMANS	9	4136.2
3379.3	U	0214	RW	I	SØ	LL	90	--	1300	ØD	GR	3	02850	3	0	002.7	RØMANS	1	4136.3
4379.3	U	0214	RW	I	SØ	ML	90	--	1300	ØD	GR	3	02850	3	0	017.8	RØMANS	9	4136.4
1392.4	T	0214	RW	I	EØ	LH	90	--	1300	ØD	GR	3	02850	3	0	001.0	SEARS	1	4137.1
2392.4	T	0214	RW	I	EØ	MH	90	--	1300	ØD	GR	3	02850	3	0	033.3	SEARS	6	4137.2
3392.4	T	0214	RW	I	EØ	LL	90	--	1300	ØD	GR	3	02850	3	0	001.4	SEARS	1	4137.3
4392.4	T	0214	RW	I	EØ	ML	90	--	1300	ØD	GR	3	02850	3	0	001.3	SEARS	1	4137.4
1380.3	U	0214	RW	I	EØ	LH	90	--	1300	ØD	GR	3	02850	3	0	002.4	SEARS	1	4138.1
2380.3	U	0214	RW	I	EØ	MH	90	--	1300	ØD	GR	3	02850	3	0	038.2	SEARS	4	4138.2
3380.3	U	0214	RW	I	EØ	LL	90	--	1300	ØD	GR	3	02850	3	0	001.9	SEARS	1	4138.3
4380.3	U	0214	RW	I	EØ	ML	90	--	1300	ØD	GR	3	02850	0	0	060.0	SEARS	D	4138.4
1393.3	T	0214	RW	I	DV	LH	90	--	1300	ØD	GR	3	04200	3	0	001.8	RØMANS	1	4139.1
2393.3	T	0214	RW	I	DV	MH	90	--	1300	ØD	GR	3	04200	1	0	005.8	RØMANS	1	4139.2
3393.3	T	0214	RW	I	DV	LL	90	--	1300	ØD	GR	3	04200	3	0	002.5	RØMANS	1	4139.3
4393.3	T	0214	RW	I	DV	ML	90	--	1300	ØD	GR	3	04200	3	0	002.4	RØMANS	1	4139.4
1381.3	U	0214	RW	I	DV	LH	90	--	1300	ØD	GR	3	04200	3	0	001.8	RØMANS	1	4140.1
2381.3	U	0214	RW	I	DV	MH	90	--	1300	ØD	GR	3	04200	1	0	039.7	RØMANS	1	4140.2
3381.3	U	0214	RW	I	DV	LL	90	--	1300	ØD	GR	3	04200	3	0	002.1	RØMANS	1	4140.3
4381.3	U	0214	RW	I	DV	ML	90	--	1300	ØD	GR	3	04200	3	0	003.8	RØMANS	1	4140.4
1394.3	T	0214	RW	I	SØ	LH	90	--	1300	ØD	GR	3	04200	3	0	004.1	SEARS	1	4141.1
2394.3	T	0214	RW	I	SØ	MH	90	--	1300	ØD	GR	3	04200	2	0	017.5	SEARS	1	4141.2
3394.3	T	0214	RW	I	SØ	LL	90	--	1300	ØD	GR	3	04200	3	0	001.5	SEARS	1	4141.3
4394.3	T	0214	RW	I	SØ	ML	90	--	1300	ØD	GR	3	04200	1	0	017.7	SEARS	9	4141.4
1382.3	U	0214	RW	I	SØ	LH	90	--	1300	ØD	GR	3	04200	3	0	006.3	SEARS	1	4142.1
2382.3	U	0214	RW	I	SØ	MH	90	--	1300	ØD	GR	3	04200	0	2	010.5	SEARS	1	4142.2
3382.3	U	0214	RW	I	SØ	LL	90	--	1300	ØD	GR	3	04200	3	0	003.8	SEARS	1	4142.3
4382.3	U	0214	RW	I	SØ	ML	90	--	1300	ØD	GR	3	04200	3	0	010.7	SEARS	9	4142.4
1395.3	T	0214	RW	I	EØ	LH	90	--	1300	ØD	GR	3	04200	3	0	003.5	RØMANS	1	4143.1
2395.3	T	0214	RW	I	EØ	MH	90	--	1300	ØD	GR	3	04200	2	0	008.9	RØMANS	7	4143.2
3395.3	T	0214	RW	I	EØ	LL	90	--	1300	ØD	GR	3	04200	3	0	003.1	RØMANS	1	4143.3
4395.3	T	0214	RW	I	EØ	ML	90	--	1300	ØD	GR	3	04200	3	0	006.1	RØMANS	4	4143.4
1383.4	U	0214	RW	I	EØ	LH	90	--	1300	ØD	GR	3	04200	3	0	013.2	RØMANS	7	4144.1
2383.4	U	0214	RW	I	EØ	MH	90	--	1300	ØD	GR	3	04200	3	0	026.5	RØMANS	7	4144.2
3383.4	U	0214	RW	I	EØ	LL	90	--	1300	ØD	GR	3	04200	3	0	009.3	RØMANS	7	4144.3
4383.4	U	0214	RW	I	EØ	ML	90	--	1300	ØD	GR	3	04200	3	0	013.8	RØMANS	7	4144.4
1396.4	T	0214	RW	I	DV	LH	90	--	1800	ØD	GR	3	01500	3	0	001.0	SEARS	1	4145.1
2396.4	T	0214	RW	I	DV	MH	90	--	1800	ØD	GR	3	01500	3	0	001.5	SEARS	1	4145.2
3396.4	T	0214	RW	I	DV	LL	90	--	1800	ØD	GR	3	01500	3	0	001.1	SEARS	1	4145.3
4396.4	T	0214	RW	I	DV	ML	90	--	1800	ØD	GR	3	01500	3	0	010.0	SEARS	1	4145.4
1384.3	U	0214	RW	I	DV	LH	90	--	1800	ØD	GR	3	01500	3	0	002.1	SEARS	1	4146.1

2384.3	U	0214	RW	I	DV	MH	90	--	1800	ØD	GR	3	01500	3	0	002.6	SEARS	1	4146.2
3384.3	U	0214	RW	I	DV	LL	90	--	1800	ØD	GR	3	01500	3	0	001.2	SEARS	1	4146.3
4384.3	U	0214	RW	I	DV	ML	90	--	1800	ØD	GR	3	01500	3	0	001.0	SEARS	1	4146.4
2397.0	T	0214	RW	I	SØ	LH	90	--	1800	ØD	GR	3	01500	3	0	001.4	RØMANS	1	4147.1
2397.0	T	0214	RW	I	SØ	MH	90	--	1800	ØD	GR	3	01500	3	0	001.2	RØMANS	1	4147.2
3397.0	T	0214	RW	I	SØ	LL	90	--	1800	ØD	GR	3	01500	3	0	001.0	RØMANS	1	4147.3
4397.0	T	0214	RW	I	SØ	ML	90	--	1800	ØD	GR	3	01500	3	0	001.0	RØMANS	1	4147.4
1385.3	U	0214	RW	I	SØ	LH	90	--	1800	ØD	GR	3	01500	3	0	026.1	RØMANS	8	4148.1
2385.3	U	0214	RW	I	SØ	MH	90	--	1800	ØD	GR	3	01500	0	0	060.0	RØMANS	H	4148.2
3385.3	U	0214	RW	I	SØ	LL	90	--	1800	ØD	GR	3	01500	0	0	060.0	RØMANS	H	4148.3
4385.3	U	0214	RW	I	SØ	ML	90	--	1800	ØD	GR	3	01500	0	0	060.0	RØMANS	H	4148.4
1398.0	T	0214	RW	I	EØ	LH	90	--	1800	ØD	GR	3	01500	3	0	002.1	SEARS	1	4149.1
2398.0	T	0214	RW	I	EØ	MH	90	--	1800	ØD	GR	3	01500	2	0	043.7	SEARS	4	4149.2
3398.0	T	0214	RW	I	EØ	LL	90	--	1800	ØD	GR	3	01500	3	0	002.2	SEARS	1	4149.3
4398.0	T	0214	RW	I	EØ	ML	90	--	1800	ØD	GR	3	01500	3	0	001.6	SEARS	1	4149.4
1386.3	U	0214	RW	I	EØ	LH	90	--	1800	ØD	GR	3	01500	3	0	003.8	SEARS	1	4150.1
2386.3	U	0214	RW	I	EØ	MH	90	--	1800	ØD	GR	3	01500	3	0	002.9	SEARS	1	4150.2
3386.3	U	0214	RW	I	EØ	LL	90	--	1800	ØD	GR	3	01500	3	0	001.7	SEARS	1	4150.3
4386.3	U	0214	RW	I	EØ	ML	90	--	1800	ØD	GR	3	01500	3	0	002.8	SEARS	1	4150.4
1399.3	T	0214	RW	I	DV	LH	90	--	1800	ØD	GR	3	02850	3	0	002.5	RØMANS	1	4151.1
2399.3	T	0214	RW	I	DV	MH	90	--	1800	ØD	GR	3	02850	3	0	003.1	RØMANS	1	4151.2
3399.3	T	0214	RW	I	DV	LL	90	--	1800	ØD	GR	3	02850	3	0	001.5	RØMANS	1	4151.3
4399.3	T	0214	RW	I	DV	ML	90	--	1800	ØD	GR	3	02850	3	0	002.5	RØMANS	1	4151.4
1387.4	U	0214	RW	I	DV	LH	90	--	1800	ØD	GR	3	02850	3	0	002.3	RØMANS	1	4152.1
2387.4	U	0214	RW	I	DV	MH	90	--	1800	ØD	GR	3	02850	3	0	002.9	RØMANS	1	4152.2
3387.4	U	0214	RW	I	DV	LL	90	--	1800	ØD	GR	3	02850	3	0	001.5	RØMANS	1	4152.3
4387.4	U	0214	RW	I	DV	ML	90	--	1800	ØD	GR	3	02850	3	0	001.6	RØMANS	1	4152.4
1401.3	T	0214	RW	I	SØ	LH	90	--	1800	ØD	GR	3	02850	3	0	003.1	SEARS	1	4153.1
2401.3	T	0214	RW	I	SØ	MH	90	--	1800	ØD	GR	3	02850	3	0	005.2	SEARS	1	4153.2
3401.3	T	0214	RW	I	SØ	LL	90	--	1800	ØD	GR	3	02850	3	0	001.8	SEARS	1	4153.3
4401.3	T	0214	RW	I	SØ	ML	90	--	1800	ØD	GR	3	02850	3	0	006.3	SEARS	1	4153.4
1388.4	U	0214	RW	I	SØ	LH	90	--	1800	ØD	GR	3	02850	0	2	012.4	SEARS	9	4154.1
2388.4	U	0214	RW	I	SØ	MH	90	--	1800	ØD	GR	3	02850	3	0	008.4	SEARS	9	4154.2
3388.4	U	0214	RW	I	SØ	LL	90	--	1800	ØD	GR	3	02850	3	0	009.0	SEARS	9	4154.3
4388.4	U	0214	RW	I	SØ	ML	90	--	1800	ØD	GR	3	02850	3	0	005.3	SEARS	1	4154.4
1402.0	T	0214	RW	I	EØ	LH	90	--	1800	ØD	GR	3	02850	3	0	006.1	RØMANS	1	4155.1
2402.0	T	0214	RW	I	EØ	MH	90	--	1800	ØD	GR	3	02850	3	0	017.5	RØMANS	6	4155.2
3402.0	T	0214	RW	I	EØ	LL	90	--	1800	ØD	GR	3	02850	3	0	001.7	RØMANS	1	4155.3
4402.0	T	0214	RW	I	EØ	ML	90	--	1800	ØD	GR	3	02850	3	0	002.6	RØMANS	1	4155.4
1389.4	U	0214	RW	I	EØ	LH	90	--	1800	ØD	GR	3	02850	3	0	007.2	RØMANS	1	4156.1
2389.4	U	0214	RW	I	EØ	MH	90	--	1800	ØD	GR	3	02850	2	0	008.0	RØMANS	1	4156.2
3389.4	U	0214	RW	I	EØ	LL	90	--	1800	ØD	GR	3	02850	3	0	005.4	RØMANS	1	4156.3
4389.4	U	0214	RW	I	EØ	ML	90	--	1800	ØD	GR	3	02850	3	0	007.8	RØMANS	1	4156.4
1407.4	T	0218	RW	I	DV	LH	90	--	1800	ØD	GR	3	04200	3	0	001.6	SEARS	1	4157.1
2407.4	T	0218	RW	I	DV	MH	90	--	1800	ØD	GR	3	04200	2	0	005.4	SEARS	1	4157.2
3407.4	T	0218	RW	I	DV	LL	90	--	1800	ØD	GR	3	04200	3	0	001.4	SEARS	1	4157.3
4407.4	T	0218	RW	I	DV	ML	90	--	1800	ØD	GR	3	04200	3	0	002.2	SEARS	1	4157.4
1405.3	U	0218	RW	I	DV	LH	90	--	1800	ØD	GR	3	04200	3	0	002.0	RØMANS	1	4158.1
2405.3	U	0218	RW	I	DV	MH	90	--	1800	ØD	GR	3	04200	2	0	008.7	RØMANS	1	4158.2
3405.3	U	0218	RW	I	DV	LL	90	--	1800	ØD	GR	3	04200	3	0	001.7	RØMANS	1	4158.3
4405.3	U	0218	RW	I	DV	ML	90	--	1800	ØD	GR	3	04200	3	0	038.5	RØMANS	1	4158.4
1408.4	T	0218	RW	I	SØ	LH	90	--	1800	ØD	GR	3	04200	3	0	008.8	SEARS	8	4159.1
2408.4	T	0218	RW	I	SØ	MH	90	--	1800	ØD	GR	3	04200	3	0	007.2	SEARS	9	4159.2

3408.4	T	0218	RW	I	SØ	LL	90	--	1800	ØD	GR	3	04200	3	0	005.2	SEARS	9	4159.3
4408.4	T	0218	RW	I	SØ	ML	90	--	1800	ØD	GR	3	04200	3	0	009.5	SEARS	9	4159.4
1404.3	U	0218	RW	I	SØ	LH	90	--	1800	ØD	GR	3	04200	3	0	002.3	RØMANS	1	4160.1
2404.3	U	0218	RW	I	SØ	MH	90	--	1800	ØD	GR	3	04200	3	0	008.7	RØMANS	9	4160.2
3404.3	U	0218	RW	I	SØ	LL	90	--	1800	ØD	GR	3	04200	3	0	001.8	RØMANS	1	4160.3
4404.3	U	0218	RW	I	SØ	ML	90	--	1800	ØD	GR	3	04200	3	0	005.0	RØMANS	1	4160.4
1409.0	T	0218	RW	I	EØ	LH	90	--	1800	ØD	GR	3	04200	3	0	003.1	SEARS	1	4161.1
2409.0	T	0218	RW	I	EØ	MH	90	--	1800	ØD	GR	3	04200	3	0	016.9	SEARS	4	4161.2
3409.0	T	0218	RW	I	EØ	LL	90	--	1800	ØD	GR	3	04200	3	0	003.0	SEARS	1	4161.3
4409.0	T	0218	RW	I	EØ	ML	90	--	1800	ØD	GR	3	04200	3	0	040.7	SEARS	4	4161.4
1406.3	U	0218	RW	I	EØ	LH	90	--	1800	ØD	GR	3	04200	3	0	005.6	RØMANS	1	4162.1
2406.3	U	0218	RW	I	EØ	MH	90	--	1800	ØD	GR	3	04200	0	0	060.0	RØMANS	G	4162.2
3406.3	U	0218	RW	I	EØ	LL	90	--	1800	ØD	GR	3	04200	3	0	004.6	RØMANS	1	4162.3
4406.3	U	0218	RW	I	EØ	ML	90	--	1800	ØD	GR	3	04200	3	0	004.5	RØMANS	1	4162.4
1476.3	T	0224	RW	J	DV	MH	90	--	0800	ØD	GR	3	01500	3	0	004.1	SEARS	1	4163.1
2476.3	T	0224	RW	J	DV	LL	90	--	0800	ØD	GR	3	01500	3	0	003.5	SEARS	1	4163.2
3476.3	T	0224	RW	J	DV	ML	90	--	0800	ØD	GR	3	01500	3	0	001.6	SEARS	1	4163.3
4476.3	T	0224	RW	J	DV	LH	90	--	0800	ØD	GR	3	01500	3	0	009.4	SEARS	1	4163.4
1464.0	U	0224	RW	J	DV	MH	90	--	0800	ØD	GR	3	01500	3	0	004.7	SEARS	1	4164.1
2464.0	U	0224	RW	J	DV	LL	90	--	0800	ØD	GR	3	01500	3	0	001.6	SEARS	1	4164.2
3464.0	U	0224	RW	J	DV	ML	90	--	0800	ØD	GR	3	01500	3	0	001.5	SEARS	1	4164.3
4464.0	U	0224	RW	J	DV	LH	90	--	0800	ØD	GR	3	01500	3	0	001.5	SEARS	1	4164.4
1477.4	T	0224	RW	J	SØ	MH	90	--	0800	ØD	GR	3	01500	1	0	010.1	RØMANS	1	4165.1
2477.4	T	0224	RW	J	SØ	LL	90	--	0800	ØD	GR	3	01500	3	0	001.1	RØMANS	1	4165.2
3477.4	T	0224	RW	J	SØ	ML	90	--	0800	ØD	GR	3	01500	3	0	001.3	RØMANS	1	4165.3
4477.4	T	0224	RW	J	SØ	LH	90	--	0800	ØD	GR	3	01500	3	0	000.5	RØMANS	1	4165.4
1465.3	U	0224	RW	J	SØ	MH	90	--	0800	ØD	GR	3	01500	3	0	013.3	RØMANS	9	4166.1
2465.3	U	0224	RW	J	SØ	LL	90	--	0800	ØD	GR	3	01500	3	0	001.5	RØMANS	1	4166.2
3465.3	U	0224	RW	J	SØ	ML	90	--	0800	ØD	GR	3	01500	3	0	002.1	RØMANS	1	4166.3
4465.3	U	0224	RW	J	SØ	LH	90	--	0800	ØD	GR	3	01500	3	0	002.0	RØMANS	1	4166.4
1478.3	T	0224	RW	J	EØ	MH	90	--	0800	ØD	GR	3	01500	0	0	060.0	SEARS	F	4167.1
2478.3	T	0224	RW	J	EØ	LL	90	--	0800	ØD	GR	3	01500	3	0	003.2	SEARS	1	4167.2
3478.3	T	0224	RW	J	EØ	ML	90	--	0800	ØD	GR	3	01500	3	0	004.8	SEARS	1	4167.3
4478.3	T	0224	RW	J	EØ	LH	90	--	0800	ØD	GR	3	01500	3	0	001.5	SEARS	1	4167.4
1466.3	U	0224	RW	J	EØ	MH	90	--	0800	ØD	GR	3	01500	3	0	007.7	SEARS	4	4168.1
2466.3	U	0224	RW	J	EØ	LL	90	--	0800	ØD	GR	3	01500	3	0	004.6	SEARS	1	4168.2
3466.3	U	0224	RW	J	EØ	ML	90	--	0800	ØD	GR	3	01500	3	0	001.8	SEARS	1	4168.3
4466.3	U	0224	RW	J	EØ	LH	90	--	0800	ØD	GR	3	01500	3	0	003.6	SEARS	1	4168.4
1479.4	T	0224	RW	J	DV	MH	90	--	0800	ØD	GR	3	02850	1	0	006.0	RØMANS	1	4169.1
2479.4	T	0224	RW	J	DV	LL	90	--	0800	ØD	GR	3	02850	3	0	001.9	RØMANS	1	4169.2
3479.4	T	0224	RW	J	DV	ML	90	--	0800	ØD	GR	3	02850	3	0	003.1	RØMANS	1	4169.3
4479.4	T	0224	RW	J	DV	LH	90	--	0800	ØD	GR	3	02850	3	0	003.8	RØMANS	1	4169.4
1467.3	U	0224	RW	J	DV	MH	90	--	0800	ØD	GR	3	02850	0	1	011.8	RØMANS	1	4170.1
2467.3	U	0224	RW	J	DV	LL	90	--	0800	ØD	GR	3	02850	3	0	002.8	RØMANS	1	4170.2
3467.3	U	0224	RW	J	DV	ML	90	--	0800	ØD	GR	3	02850	3	0	002.1	RØMANS	1	4170.3
4467.3	U	0224	RW	J	DV	LH	90	--	0800	ØD	GR	3	02850	3	0	002.2	RØMANS	1	4170.4
1480.4	T	0224	RW	J	SØ	MH	90	--	0800	ØD	GR	3	02850	3	0	019.4	SEARS	9	4171.1
2480.4	T	0224	RW	J	SØ	LL	90	--	0800	ØD	GR	3	02850	3	0	011.8	SEARS	9	4171.2
3480.4	T	0224	RW	J	SØ	ML	90	--	0800	ØD	GR	3	02850	2	0	011.0	SEARS	1	4171.3
4480.4	T	0224	RW	J	SØ	LH	90	--	0800	ØD	GR	3	02850	2	2	009.2	SEARS	9	4171.4
1468.0	U	0224	RW	J	SØ	MH	90	--	0800	ØD	GR	3	02850	0	1	021.8	SEARS	9	4172.1
2468.0	U	0224	RW	J	SØ	LL	90	--	0800	ØD	GR	3	02850	3	0	005.1	SEARS	1	4172.2
3468.0	U	0224	RW	J	SØ	ML	90	--	0800	ØD	GR	3	02850	3	0	010.2	SEARS	9	4172.3

4468.0	U	0224	RW	J	SØ	LH	90	--	0800	ØD	GR	3	02850	0	0	060.0	SEARS	H	4172.4
1481.4	T	0224	RW	J	EØ	MH	90	--	0800	ØD	GR	3	02850	1	0	022.8	RØMANS	7	4173.1
2481.4	T	0224	RW	J	EØ	LL	90	--	0800	ØD	GR	3	02850	3	0	004.2	RØMANS	1	4173.2
3481.4	T	0224	RW	J	EØ	ML	90	--	0800	ØD	GR	3	02850	3	0	002.7	RØMANS	1	4173.3
4481.4	T	0224	RW	J	EØ	LH	90	--	0800	ØD	GR	3	02850	3	0	002.4	RØMANS	1	4173.4
1469.4	U	0224	RW	J	EØ	MH	90	--	0800	ØD	GR	3	02850	2	0	025.6	RØMANS	7	4174.1
2469.4	U	0224	RW	J	EØ	LL	90	--	0800	ØD	GR	3	02850	3	0	004.1	RØMANS	1	4174.2
3469.4	U	0224	RW	J	EØ	ML	90	--	0800	ØD	GR	3	02850	3	0	003.1	RØMANS	1	4174.3
4469.4	U	0224	RW	J	EØ	LH	90	--	0800	ØD	GR	3	02850	3	0	002.9	RØMANS	1	4174.4
1482.4	T	0224	RW	J	DV	MH	90	--	0800	ØD	GR	3	04200	3	0	004.7	SEARS	1	4175.1
2482.4	T	0224	RW	J	DV	LL	90	--	0800	ØD	GR	3	04200	3	0	001.9	SEARS	1	4175.2
3482.4	T	0224	RW	J	DV	ML	90	--	0800	ØD	GR	3	04200	3	0	001.7	SEARS	1	4175.3
4482.4	T	0224	RW	J	DV	LH	90	--	0800	ØD	GR	3	04200	3	0	002.3	SEARS	1	4175.4
1470.4	U	0224	RW	J	DV	MH	90	--	0800	ØD	GR	3	04200	0	1	032.7	SEARS	1	4176.1
2470.4	U	0224	RW	J	DV	LL	90	--	0800	ØD	GR	3	04200	3	0	027.6	SEARS	1	4176.2
3470.4	U	0224	RW	J	DV	ML	90	--	0800	ØD	GR	3	04200	3	0	007.2	SEARS	1	4176.3
4470.4	U	0224	RW	J	DV	LH	90	--	0800	ØD	GR	3	04200	0	2	044.7	SEARS	1	4176.4
1483.4	T	0224	RW	J	SØ	MH	90	--	0800	ØD	GR	3	04200	3	0	008.5	RØMANS	9	4177.1
2483.4	T	0224	RW	J	SØ	LL	90	--	0800	ØD	GR	3	04200	3	0	011.7	RØMANS	9	4177.2
3483.4	T	0224	RW	J	SØ	ML	90	--	0800	ØD	GR	3	04200	3	0	008.5	RØMANS	9	4177.3
4483.4	T	0224	RW	J	SØ	LH	90	--	0800	ØD	GR	3	04200	3	0	006.5	RØMANS	9	4177.4
1471.3	U	0224	RW	J	SØ	MH	90	--	0800	ØD	GR	3	04200	0	3	040.8	RØMANS	9	4178.1
2471.3	U	0224	RW	J	SØ	LL	90	--	0800	ØD	GR	3	04200	3	0	005.1	RØMANS	1	4178.2
3471.3	U	0224	RW	J	SØ	ML	90	--	0800	ØD	GR	3	04200	1	0	004.2	RØMANS	1	4178.3
4471.3	U	0224	RW	J	SØ	LH	90	--	0800	ØD	GR	3	04200	3	0	012.4	RØMANS	1	4178.4
1484.4	T	0224	RW	J	EØ	MH	90	--	0800	ØD	GR	3	04200	3	0	017.9	SEARS	9	4179.1
2484.4	T	0224	RW	J	EØ	LL	90	--	0800	ØD	GR	3	04200	3	0	005.6	SEARS	9	4179.2
3484.4	T	0224	RW	J	EØ	ML	90	--	0800	ØD	GR	3	04200	3	0	003.5	SEARS	9	4179.3
4484.4	T	0224	RW	J	EØ	LH	90	--	0800	ØD	GR	3	04200	3	0	008.7	SEARS	9	4179.4
1472.3	U	0224	RW	J	EØ	MH	90	--	0800	ØD	GR	3	04200	0	0	060.0	SEARS	G	4180.1
2472.3	U	0224	RW	J	EØ	LL	90	--	0800	ØD	GR	3	04200	3	0	013.3	SEARS	7	4180.2
3472.3	U	0224	RW	J	EØ	ML	90	--	0800	ØD	GR	3	04200	3	0	010.3	SEARS	4	4180.3
4472.3	U	0224	RW	J	EØ	LH	90	--	0800	ØD	GR	3	04200	0	0	060.0	SEARS	G	4180.4
1485.3	T	0224	RW	J	DV	MH	90	--	1300	ØD	GR	3	01500	3	0	002.6	RØMANS	1	4181.1
2485.3	T	0224	RW	J	DV	LL	90	--	1300	ØD	GR	3	01500	3	0	001.1	RØMANS	1	4181.2
3485.3	T	0224	RW	J	DV	ML	90	--	1300	ØD	GR	3	01500	3	0	001.6	RØMANS	1	4181.3
4485.3	T	0224	RW	J	DV	LH	90	--	1300	ØD	GR	3	01500	3	0	001.2	RØMANS	1	4181.4
1473.4	U	0224	RW	J	DV	MH	90	--	1300	ØD	GR	3	01500	1	0	045.9	RØMANS	1	4182.1
2473.4	U	0224	RW	J	DV	LL	90	--	1300	ØD	GR	3	01500	3	0	003.1	RØMANS	1	4182.2
3473.4	U	0224	RW	J	DV	ML	90	--	1300	ØD	GR	3	01500	3	0	002.3	RØMANS	1	4182.3
4473.4	U	0224	RW	J	DV	LH	90	--	1300	ØD	GR	3	01500	3	0	003.3	RØMANS	1	4182.4
1486.4	T	0224	RW	J	SØ	MH	90	--	1300	ØD	GR	3	01500	3	0	004.1	SEARS	1	4183.1
2486.4	T	0224	RW	J	SØ	LL	90	--	1300	ØD	GR	3	01500	3	0	002.8	SEARS	1	4183.2
3486.4	T	0224	RW	J	SØ	ML	90	--	1300	ØD	GR	3	01500	3	0	002.5	SEARS	1	4183.3
4486.4	T	0224	RW	J	SØ	LH	90	--	1300	ØD	GR	3	01500	3	0	002.5	SEARS	1	4183.4
1474.3	U	0224	RW	J	SØ	MH	90	--	1300	ØD	GR	3	01500	3	0	017.3	SEARS	1	4184.1
2474.3	U	0224	RW	J	SØ	LL	90	--	1300	ØD	GR	3	01500	3	0	001.5	SEARS	1	4184.2
3474.3	U	0224	RW	J	SØ	ML	90	--	1300	ØD	GR	3	01500	3	0	001.7	SEARS	1	4184.3
4474.3	U	0224	RW	J	SØ	LH	90	--	1300	ØD	GR	3	01500	3	0	001.4	SEARS	1	4184.4
1512.5	T	0225	RW	J	EØ	MH	90	--	1300	ØD	GR	3	01500	0	1	027.9	SEARS	7	4185.1
2512.5	T	0225	RW	J	EØ	LL	90	--	1300	ØD	GR	3	01500	3	0	003.9	SEARS	1	4185.2
3512.5	T	0225	RW	J	EØ	ML	90	--	1300	ØD	GR	3	01500	3	0	001.0	SEARS	1	4185.3
4512.5	T	0225	RW	J	EØ	LH	90	--	1300	ØD	GR	3	01500	3	0	001.0	SEARS	1	4185.4

1475.3	U	0224	RW	J	EØ	MH	90	--	1300	ØD	GR	3	01500	3	0	005.2	RØMANS	1	4186.1
2475.3	U	0224	RW	J	EØ	LL	90	--	1300	ØD	GR	3	01500	3	0	001.5	RØMANS	1	4186.2
3475.3	U	0224	RW	J	EØ	ML	90	--	1300	ØD	GR	3	01500	3	0	001.6	RØMANS	1	4186.3
4475.3	U	0224	RW	J	EØ	LH	90	--	1300	ØD	GR	3	01500	3	0	001.8	RØMANS	1	4186.4
1499.4	T	0225	RW	J	DV	MH	90	--	1300	ØD	GR	3	02850	2	0	030.1	SEARS	1	4187.1
2499.4	T	0225	RW	J	DV	LL	90	--	1300	ØD	GR	3	02850	3	0	017.7	SEARS	1	4187.2
3499.4	T	0225	RW	J	DV	ML	90	--	1300	ØD	GR	3	02850	3	0	005.7	SEARS	1	4187.3
4499.4	T	0225	RW	J	DV	LH	90	--	1300	ØD	GR	3	02850	3	0	005.5	SEARS	1	4187.4
1487.3	U	0225	RW	J	DV	MH	90	--	1300	ØD	GR	3	02850	1	0	035.3	SEARS	1	4188.1
2487.3	U	0225	RW	J	DV	LL	90	--	1300	ØD	GR	3	02850	3	0	011.7	SEARS	1	4188.2
3487.3	U	0225	RW	J	DV	ML	90	--	1300	ØD	GR	3	02850	3	0	009.0	SEARS	1	4188.3
4487.3	U	0225	RW	J	DV	LH	90	--	1300	ØD	GR	3	02850	3	0	003.1	SEARS	1	4188.4
1501.4	T	0225	RW	J	SØ	MH	90	--	1300	ØD	GR	3	02850	0	1	014.7	RØMANS	9	4189.1
2501.4	T	0225	RW	J	SØ	LL	90	--	1300	ØD	GR	3	02850	3	0	001.7	RØMANS	1	4189.2
3501.4	T	0225	RW	J	SØ	ML	90	--	1300	ØD	GR	3	02850	3	0	002.5	RØMANS	1	4189.3
4501.4	T	0225	RW	J	SØ	LH	90	--	1300	ØD	GR	3	02850	3	0	002.2	RØMANS	1	4189.4
1488.3	U	0225	RW	J	SØ	MH	90	--	1300	ØD	GR	3	02850	3	0	010.9	RØMANS	9	4190.1
2488.3	U	0225	RW	J	SØ	LL	90	--	1300	ØD	GR	3	02850	3	0	002.8	RØMANS	1	4190.2
3488.3	U	0225	RW	J	SØ	ML	90	--	1300	ØD	GR	3	02850	3	0	002.1	RØMANS	1	4190.3
4488.3	U	0225	RW	J	SØ	LH	90	--	1300	ØD	GR	3	02850	3	0	002.0	RØMANS	1	4190.4
1502.4	T	0225	RW	J	EØ	MH	90	--	1300	ØD	GR	3	02850	1	0	011.9	SEARS	4	4191.1
2502.4	T	0225	RW	J	EØ	LL	90	--	1300	ØD	GR	3	02850	0	0	007.2	SEARS	N	4191.2
3502.4	T	0225	RW	J	EØ	ML	90	--	1300	ØD	GR	3	02850	3	0	013.8	SEARS	4	4191.3
4502.4	T	0225	RW	J	EØ	LH	90	--	1300	ØD	GR	3	02850	3	0	007.3	SEARS	4	4191.4
1489.3	U	0225	RW	J	EØ	MH	90	--	1300	ØD	GR	3	02850	3	0	034.0	SEARS	7	4192.1
2489.3	U	0225	RW	J	EØ	LL	90	--	1300	ØD	GR	3	02850	3	0	002.4	SEARS	1	4192.2
3489.3	U	0225	RW	J	EØ	ML	90	--	1300	ØD	GR	3	02850	3	0	004.7	SEARS	1	4192.3
4489.3	U	0225	RW	J	EØ	LH	90	--	1300	ØD	GR	3	02850	3	0	003.4	SEARS	1	4192.4
1503.5	T	0225	RW	J	DV	MH	90	--	1300	ØD	GR	3	04200	0	3	018.7	RØMANS	1	4193.1
2503.5	T	0225	RW	J	DV	LL	90	--	1300	ØD	GR	3	04200	3	0	001.7	RØMANS	1	4193.2
3503.5	T	0225	RW	J	DV	ML	90	--	1300	ØD	GR	3	04200	3	0	006.0	RØMANS	1	4193.3
4503.5	T	0225	RW	J	DV	LH	90	--	1300	ØD	GR	3	04200	3	0	003.1	RØMANS	1	4193.4
1490.3	U	0225	RW	J	DV	MH	90	--	1300	ØD	GR	3	04200	3	0	010.1	RØMANS	1	4194.1
2490.3	U	0225	RW	J	DV	LL	90	--	1300	ØD	GR	3	04200	3	0	003.1	RØMANS	1	4194.2
3490.3	U	0225	RW	J	DV	ML	90	--	1300	ØD	GR	3	04200	0	2	011.2	RØMANS	1	4194.3
4490.3	U	0225	RW	J	DV	LH	90	--	1300	ØD	GR	3	04200	3	0	002.5	RØMANS	1	4194.4
1504.3	T	0225	RW	J	SØ	MH	90	--	1300	ØD	GR	3	04200	1	0	010.9	SEARS	9	4195.1
2504.3	T	0225	RW	J	SØ	LL	90	--	1300	ØD	GR	3	04200	3	0	005.8	SEARS	9	4195.2
3504.3	T	0225	RW	J	SØ	ML	90	--	1300	ØD	GR	3	04200	3	0	005.9	SEARS	9	4195.3
4504.3	T	0225	RW	J	SØ	LH	90	--	1300	ØD	GR	3	04200	3	0	007.2	SEARS	9	4195.4
1491.3	U	0225	RW	J	SØ	MH	90	--	1300	ØD	GR	3	04200	3	0	035.6	SEARS	9	4196.1
2491.3	U	0225	RW	J	SØ	LL	90	--	1300	ØD	GR	3	04200	3	0	004.4	SEARS	1	4196.2
3491.3	U	0225	RW	J	SØ	ML	90	--	1300	ØD	GR	3	04200	0	0	004.4	SEARS	N	4196.3
4491.3	U	0225	RW	J	SØ	LH	90	--	1300	ØD	GR	3	04200	3	0	011.5	SEARS	1	4196.4
1505.4	T	0225	RW	J	EØ	MH	90	--	1300	ØD	GR	3	04200	3	0	026.2	RØMANS	7	4197.1
2505.4	T	0225	RW	J	EØ	LL	90	--	1300	ØD	GR	3	04200	3	0	002.1	RØMANS	1	4197.2
3505.4	T	0225	RW	J	EØ	ML	90	--	1300	ØD	GR	3	04200	3	0	001.4	RØMANS	1	4197.3
4505.4	T	0225	RW	J	EØ	LH	90	--	1300	ØD	GR	3	04200	3	0	001.2	RØMANS	1	4197.4
1492.3	U	0225	RW	J	EØ	MH	90	--	1300	ØD	GR	3	04200	0	1	017.7	RØMANS	7	4198.1
2492.3	U	0225	RW	J	EØ	LL	90	--	1300	ØD	GR	3	04200	3	0	003.5	RØMANS	1	4198.2
3492.3	U	0225	RW	J	EØ	ML	90	--	1300	ØD	GR	3	04200	0	0	060.0	RØMANS	G	4198.3
4492.3	U	0225	RW	J	EØ	LH	90	--	1300	ØD	GR	3	04200	3	0	002.4	RØMANS	1	4198.4
1506.4	T	0225	RW	J	DV	MH	90	--	1800	ØD	GR	3	01500	2	0	016.8	SEARS	1	4199.1

2506.4	T	0225	RW	J	DV	LL	90	--	1800	OD	GR	3	01500	3	0	001.7	SEARS	1	4199.2
3506.4	T	0225	RW	J	DV	ML	90	--	1800	OD	GR	3	01500	3	0	002.9	SEARS	1	4199.3
4506.4	T	0225	RW	J	DV	LH	90	--	1800	OD	GR	3	01500	3	0	001.5	SEARS	1	4199.4
1493.4	U	0225	RW	J	DV	MH	90	--	1800	OD	GR	3	01500	3	0	006.0	SEARS	1	4200.1
2493.4	U	0225	RW	J	DV	LL	90	--	1800	OD	GR	3	01500	3	0	007.5	SEARS	1	4200.2
3493.4	U	0225	RW	J	DV	ML	90	--	1800	OD	GR	3	01500	0	0	003.2	SEARS	N	4200.3
4493.4	U	0225	RW	J	DV	LH	90	--	1800	OD	GR	3	01500	3	0	006.7	SEARS	1	4200.4
1507.7	T	0225	RW	J	SB	MH	90	--	1800	OD	GR	3	01500	3	0	006.4	ROMANS	1	4201.1
2507.7	T	0225	RW	J	SB	LL	90	--	1800	OD	GR	3	01500	3	0	004.1	ROMANS	1	4201.2
3507.7	T	0225	RW	J	SB	ML	90	--	1800	OD	GR	3	01500	3	0	004.3	ROMANS	1	4201.3
4507.7	T	0225	RW	J	SB	LH	90	--	1800	OD	GR	3	01500	3	0	005.1	ROMANS	1	4201.4
1494.4	U	0225	RW	J	SB	MH	90	--	1800	OD	GR	3	01500	3	0	004.2	ROMANS	1	4202.1
2494.4	U	0225	RW	J	SB	LL	90	--	1800	OD	GR	3	01500	3	0	002.5	ROMANS	1	4202.2
3494.4	U	0225	RW	J	SB	ML	90	--	1800	OD	GR	3	01500	3	0	002.6	ROMANS	1	4202.3
4494.4	U	0225	RW	J	SB	LH	90	--	1800	OD	GR	3	01500	3	0	005.1	ROMANS	1	4202.4
1508.3	T	0225	RW	J	EB	MH	90	--	1800	OD	GR	3	01500	3	0	006.3	SEARS	1	4203.1
2508.3	T	0225	RW	J	EB	LL	90	--	1800	OD	GR	3	01500	3	0	002.0	SEARS	1	4203.2
3508.3	T	0225	RW	J	EB	ML	90	--	1800	OD	GR	3	01500	3	0	001.8	SEARS	1	4203.3
4508.3	T	0225	RW	J	EB	LH	90	--	1800	OD	GR	3	01500	3	0	001.4	SEARS	1	4203.4
1495.4	U	0225	RW	J	EB	MH	90	--	1800	OD	GR	3	01500	3	0	004.4	SEARS	1	4204.1
2495.4	U	0225	RW	J	EB	LL	90	--	1800	OD	GR	3	01500	3	0	003.6	SEARS	1	4204.2
3495.4	U	0225	RW	J	EB	ML	90	--	1800	OD	GR	3	01500	3	0	005.2	SEARS	1	4204.3
4495.4	U	0225	RW	J	EB	LH	90	--	1800	OD	GR	3	01500	3	0	002.6	SEARS	1	4204.4
1509.3	T	0225	RW	J	DV	MH	90	--	1800	OD	GR	3	02850	1	0	010.0	ROMANS	1	4205.1
2509.3	T	0225	RW	J	DV	LL	90	--	1800	OD	GR	3	02850	3	0	001.7	ROMANS	1	4205.2
3509.3	T	0225	RW	J	DV	ML	90	--	1800	OD	GR	3	02850	3	0	002.7	ROMANS	1	4205.3
4509.3	T	0225	RW	J	DV	LH	90	--	1800	OD	GR	3	02850	3	0	006.1	ROMANS	1	4205.4
1496.0	U	0225	RW	J	DV	MH	90	--	1800	OD	GR	3	02850	1	0	014.5	ROMANS	1	4206.1
2496.0	U	0225	RW	J	DV	LL	90	--	1800	OD	GR	3	02850	3	0	004.1	ROMANS	1	4206.2
3496.0	U	0225	RW	J	DV	ML	90	--	1800	OD	GR	3	02850	3	0	002.5	ROMANS	1	4206.3
4496.0	U	0225	RW	J	DV	LH	90	--	1800	OD	GR	3	02850	3	0	006.4	ROMANS	1	4206.4
1510.3	T	0225	RW	J	SB	MH	90	--	1800	OD	GR	3	02850	2	0	023.6	SEARS	9	4207.1
2510.3	T	0225	RW	J	SB	LL	90	--	1800	OD	GR	3	02850	3	0	004.2	SEARS	1	4207.2
3510.3	T	0225	RW	J	SB	ML	90	--	1800	OD	GR	3	02850	3	0	002.0	SEARS	1	4207.3
4510.3	T	0225	RW	J	SB	LH	90	--	1800	OD	GR	3	02850	3	0	002.8	SEARS	1	4207.4
1497.4	U	0225	RW	J	SB	MH	90	--	1800	OD	GR	3	02850	3	0	036.2	SEARS	9	4208.1
2497.4	U	0225	RW	J	SB	LL	90	--	1800	OD	GR	3	02850	3	0	006.4	SEARS	1	4208.2
3497.4	U	0225	RW	J	SB	ML	90	--	1800	OD	GR	3	02850	3	0	002.9	SEARS	1	4208.3
4497.4	U	0225	RW	J	SB	LH	90	--	1800	OD	GR	3	02850	3	0	002.2	SEARS	1	4208.4
1511.4	T	0225	RW	J	EB	MH	90	--	1800	OD	GR	3	02850	0	3	007.6	ROMANS	1	4209.1
2511.4	T	0225	RW	J	EB	LL	90	--	1800	OD	GR	3	02850	3	0	002.4	ROMANS	1	4209.2
3511.4	T	0225	RW	J	EB	ML	90	--	1800	OD	GR	3	02850	3	0	001.8	ROMANS	1	4209.3
4511.4	T	0225	RW	J	EB	LH	90	--	1800	OD	GR	3	02850	3	0	002.0	ROMANS	1	4209.4
1498.3	U	0225	RW	J	EB	MH	90	--	1800	OD	GR	3	02850	2	0	025.9	ROMANS	7	4210.1
2498.3	U	0225	RW	J	EB	LL	90	--	1800	OD	GR	3	02850	3	0	003.7	ROMANS	1	4210.2
3498.3	U	0225	RW	J	EB	ML	90	--	1800	OD	GR	3	02850	2	0	003.3	ROMANS	1	4210.3
4498.3	U	0225	RW	J	EB	LH	90	--	1800	OD	GR	3	02850	3	0	002.3	ROMANS	1	4210.4
1516.0	T	0226	RW	J	DV	MH	90	--	1800	OD	GR	3	04200	0	1	003.3	ROMANS	1	4211.1
2516.0	T	0226	RW	J	DV	LL	90	--	1800	OD	GR	3	04200	3	0	001.3	ROMANS	1	4211.2
3516.0	T	0226	RW	J	DV	ML	90	--	1800	OD	GR	3	04200	3	0	001.6	ROMANS	1	4211.3
4516.0	T	0226	RW	J	DV	LH	90	--	1800	OD	GR	3	04200	3	0	001.5	ROMANS	1	4211.4
1513.0	U	0226	RW	J	DV	MH	90	--	1800	OD	GR	3	04200	0	3	056.1	SEARS	1	4212.1
2513.0	U	0226	RW	J	DV	LL	90	--	1800	OD	GR	3	04200	3	0	007.1	SEARS	1	4212.2

3513.0	U	0226	RW	J	DV	ML	90	--	1800	ØD	GR	3	04200	3	0	005.7	SEARS	1	4212.3
4513.0	U	0226	RW	J	DV	LH	90	--	1800	ØD	GR	3	04200	0	3	026.6	SEARS	1	4212.4
1517.3	T	0226	RW	J	SØ	MH	90	--	1800	ØD	GR	3	04200	0	1	009.9	SEARS	1	4213.1
2517.3	T	0226	RW	J	SØ	LL	90	--	1800	ØD	GR	3	04200	3	0	004.6	SEARS	1	4213.2
3517.3	T	0226	RW	J	SØ	ML	90	--	1800	ØD	GR	3	04200	3	0	003.5	SEARS	1	4213.3
4517.3	T	0226	RW	J	SØ	LH	90	--	1800	ØD	GR	3	04200	3	0	013.2	SEARS	9	4213.4
1514.3	U	0226	RW	J	SØ	MH	90	--	1800	ØD	GR	3	04200	0	0	060.0	RØMANS	J	4214.1
2514.3	U	0226	RW	J	SØ	LL	90	--	1800	ØD	GR	3	04200	3	0	003.0	RØMANS	1	4214.2
3514.3	U	0226	RW	J	SØ	ML	90	--	1800	ØD	GR	3	04200	3	0	004.5	RØMANS	1	4214.3
4514.3	U	0226	RW	J	SØ	LH	90	--	1800	ØD	GR	3	04200	3	0	004.4	RØMANS	1	4214.4
1518.0	T	0226	RW	J	EØ	MH	90	--	1800	ØD	GR	3	04200	0	0	060.0	RØMANS	G	4215.1
2518.0	T	0226	RW	J	EØ	LL	90	--	1800	ØD	GR	3	04200	3	0	017.3	RØMANS	7	4215.2
3518.0	T	0226	RW	J	EØ	ML	90	--	1800	ØD	GR	3	04200	3	0	020.3	RØMANS	7	4215.3
4518.0	T	0226	RW	J	EØ	LH	90	--	1800	ØD	GR	3	04200	3	0	017.9	RØMANS	7	4215.4
1515.3	U	0226	RW	J	EØ	MH	90	--	1800	ØD	GR	3	04200	3	0	041.5	SEARS	6	4216.1
2515.3	U	0226	RW	J	EØ	LL	90	--	1800	ØD	GR	3	04200	3	0	002.8	SEARS	1	4216.2
3515.3	U	0226	RW	J	EØ	ML	90	--	1800	ØD	GR	3	04200	2	0	002.8	SEARS	1	4216.3
4515.3	U	0226	RW	J	EØ	LH	90	--	1800	ØD	GR	3	04200	3	0	002.2	SEARS	1	4216.4

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******          DATA FRØM SEEKVAL EXPERIMENT 5          ******

1531.3 T 0227 RW K DV M  90 -- 0800 ØD BR 3 01500 1 0  021.4 SEARS    1 5001.1
2531.3 T 0227 RW K DV H  90 -- 0800 ØD GR 3 01500 3 0  009.8 SEARS    1 5001.2
3531.3 T 0227 RW K DV L  90 -- 0800 PT BR 3 01500 3 0  001.5 SEARS    1 5001.3
4531.3 T 0227 RW K DV M  90 -- 0800 PT GR 3 01500 3 0  002.6 SEARS    1 5001.4
1519.0 U 0227 RW K DV M  90 -- 0800 ØD BR 3 01500 3 0  008.5 SEARS    1 5002.1
2519.0 U 0227 RW K DV H  90 -- 0800 ØD GR 3 01500 3 0  006.6 SEARS    1 5002.2
3519.0 U 0227 RW K DV L  90 -- 0800 PT BR 3 01500 3 0  003.2 SEARS    1 5002.3
4519.0 U 0227 RW K DV M  90 -- 0800 PT GR 3 01500 3 0  003.2 SEARS    1 5002.4
1532.4 T 0227 RW K DV M  90 -- 0800 ØD BR 3 01500 3 0  003.5 RØMANS   1 5003.1
2532.4 T 0227 RW K DV H  90 -- 0800 ØD GR 3 01500 3 0  004.8 RØMANS   1 5003.2
3532.4 T 0227 RW K DV L  90 -- 0800 PT BR 3 01500 3 0  003.6 RØMANS   1 5003.3
4532.4 T 0227 RW K DV M  90 -- 0800 PT GR 3 01500 3 0  008.3 RØMANS   1 5003.4
1520.3 U 0227 RW K DV M  90 -- 0800 ØD BR 3 01500 3 0  005.0 RØMANS   1 5004.1
2520.3 U 0227 RW K DV H  90 -- 0800 ØD GR 3 01500 3 0  002.0 RØMANS   1 5004.2
3520.3 U 0227 RW K DV L  90 -- 0800 PT BR 3 01500 3 0  001.3 RØMANS   1 5004.3
4520.3 U 0227 RW K DV M  90 -- 0800 PT GR 3 01500 3 0  002.1 RØMANS   1 5004.4
1533.3 T 0227 RW K SØ M  90 -- 0800 ØD BR 3 01500 0 0  019.8 SEARS    9 5005.1
2533.3 T 0227 RW K SØ H  90 -- 0800 ØD GR 3 01500 3 0  008.6 SEARS    9 5005.2
3533.3 T 0227 RW K SØ L  90 -- 0800 PT BR 3 01500 3 0  002.3 SEARS    1 5005.3
4533.3 T 0227 RW K SØ M  90 -- 0800 PT GR 3 01500 3 0  002.2 SEARS    1 5005.4
1521.3 U 0227 RW K SØ M  90 -- 0800 ØD BR 3 01500 3 0  025.7 SEARS    9 5006.1
2521.3 U 0227 RW K SØ H  90 -- 0800 ØD GR 3 01500 2 0  003.8 SEARS    1 5006.2
3521.3 U 0227 RW K SØ L  90 -- 0800 PT BR 3 01500 3 0  001.8 SEARS    1 5006.3
4521.3 U 0227 RW K SØ M  90 -- 0800 PT GR 3 01500 3 0  002.8 SEARS    1 5006.4
1534.4 T 0227 RW K SØ M  90 -- 0800 ØD BR 3 01500 3 0  004.7 RØMANS   1 5007.1
2534.4 T 0227 RW K SØ H  90 -- 0800 ØD GR 3 01500 2 0  001.8 RØMANS   1 5007.2
3534.4 T 0227 RW K SØ L  90 -- 0800 PT BR 3 01500 3 0  001.9 RØMANS   1 5007.3
4534.4 T 0227 RW K SØ M  90 -- 0800 PT GR 3 01500 3 0  002.3 RØMANS   1 5007.4
1522.3 U 0227 RW K SØ M  90 -- 0800 ØD BR 3 01500 3 0  040.5 RØMANS   1 5008.1
2522.3 U 0227 RW K SØ H  90 -- 0800 ØD GR 3 01500 3 0  004.8 RØMANS   1 5008.2
3522.3 U 0227 RW K SØ L  90 -- 0800 PT BR 3 01500 3 0  002.6 RØMANS   1 5008.3
4522.3 U 0227 RW K SØ M  90 -- 0800 PT GR 3 01500 3 0  002.7 RØMANS   1 5008.4
1535.4 T 0227 RW K EØ M  90 -- 0800 ØD BR 3 01500 3 0  012.7 SEARS    7 5009.1
2535.4 T 0227 RW K EØ H  90 -- 0800 ØD GR 3 01500 3 0  004.9 SEARS    1 5009.2
3535.4 T 0227 RW K EØ L  90 -- 0800 PT BR 3 01500 3 0  002.0 SEARS    1 5009.3
4535.4 T 0227 RW K EØ M  90 -- 0800 PT GR 3 01500 3 0  002.1 SEARS    1 5009.4
1523.0 U 0227 RW K EØ M  90 -- 0800 ØD BR 3 01500 3 0  026.8 SEARS    7 5010.1
2523.0 U 0227 RW K EØ H  90 -- 0800 ØD GR 3 01500 3 0  057.3 SEARS    7 5010.2
3523.0 U 0227 RW K EØ L  90 -- 0800 PT BR 3 01500 3 0  004.6 SEARS    1 5010.3
4523.0 U 0227 RW K EØ M  90 -- 0800 PT GR 3 01500 3 0  006.5 SEARS    1 5010.4
1536.4 T 0227 RW K EØ M  90 -- 0800 ØD BR 3 01500 3 0  005.2 RØMANS   1 5011.1
2536.4 T 0227 RW K EØ H  90 -- 0800 ØD GR 3 01500 3 0  002.3 RØMANS   1 5011.2
3536.4 T 0227 RW K EØ L  90 -- 0800 PT BR 3 01500 3 0  004.8 RØMANS   1 5011.3
4536.4 T 0227 RW K EØ M  90 -- 0800 PT GR 3 01500 3 3  010.0 RØMANS   1 5011.4
1524.0 U 0227 RW K EØ M  90 -- 0800 ØD BR 3 01500 3 0  026.3 RØMANS   7 5012.1
2524.0 U 0227 RW K EØ H  90 -- 0800 ØD GR 3 01500 3 0  012.0 RØMANS   7 5012.2
3524.0 U 0227 RW K EØ L  90 -- 0800 PT BR 3 01500 3 0  003.9 RØMANS   1 5012.3
4524.0 U 0227 RW K EØ M  90 -- 0800 PT GR 3 01500 3 0  007.7 RØMANS   4 5012.4
1537.3 T 0227 RW K DV M  90 -- 0800 ØD BR 3 04200 0 1  008.5 SEARS    1 5013.1
2537.3 T 0227 RW K DV H  90 -- 0800 ØD GR 3 04200 0 0  018.0 SEARS    1 5013.2
3537.3 T 0227 RW K DV L  90 -- 0800 PT BR 3 04200 0 0  011.3 SEARS    1 5013.3
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4537.3	T	0227	RW	K	DV	M	90	--	0800	PT	GR	3	04200	3	0	001.4	SEARS	1	5013.4
1525.4	U	0227	RW	K	DV	M	90	--	0800	ØD	BR	3	04200	0	1	042.1	SEARS	1	5014.1
2525.4	U	0227	RW	K	DV	H	90	--	0800	ØD	GR	3	04200	0	0	060.0	SEARS	1	5014.2
3525.4	U	0227	RW	K	DV	L	90	--	0800	PT	BR	3	04200	3	0	005.7	SEARS	1	5014.3
4525.4	U	0227	RW	K	DV	M	90	--	0800	PT	GR	3	04200	3	0	040.0	SEARS	1	5014.4
1538.4	T	0227	RW	K	DV	M	90	--	0800	ØD	BR	3	04200	0	3	004.4	RØMANS	1	5015.1
2538.4	T	0227	RW	K	DV	H	90	--	0800	ØD	GR	3	04200	2	1	019.5	RØMANS	1	5015.2
3538.4	T	0227	RW	K	DV	L	90	--	0800	PT	BR	3	04200	3	0	001.6	RØMANS	1	5015.3
4538.4	T	0227	RW	K	DV	M	90	--	0800	PT	GR	3	04200	3	0	004.4	RØMANS	1	5015.4
1526.4	U	0227	RW	K	DV	M	90	--	0800	ØD	BR	3	04200	0	1	010.4	RØMANS	1	5016.1
2526.4	U	0227	RW	K	DV	H	90	--	0800	ØD	GR	3	04200	0	1	038.5	RØMANS	1	5016.2
3526.4	U	0227	RW	K	DV	L	90	--	0800	PT	BR	3	04200	3	0	001.7	RØMANS	1	5016.3
4526.4	U	0227	RW	K	DV	M	90	--	0800	PT	GR	3	04200	0	1	039.2	RØMANS	1	5016.4
1539.4	T	0227	RW	K	SØ	M	90	--	0800	ØD	BR	3	04200	2	0	016.2	SEARS	9	5017.1
2539.4	T	0227	RW	K	SØ	H	90	--	0800	ØD	GR	3	04200	3	0	017.6	SEARS	9	5017.2
3539.4	T	0227	RW	K	SØ	L	90	--	0800	PT	BR	3	04200	3	0	002.0	SEARS	1	5017.3
4539.4	T	0227	RW	K	SØ	M	90	--	0800	PT	GR	3	04200	3	0	010.0	SEARS	9	5017.4
1527.3	U	0227	RW	K	SØ	M	90	--	0800	ØD	BR	3	04200	0	2	009.1	SEARS	9	5018.1
2527.3	U	0227	RW	K	SØ	H	90	--	0800	ØD	GR	3	04200	3	0	014.2	SEARS	9	5018.2
3527.3	U	0227	RW	K	SØ	L	90	--	0800	PT	BR	3	04200	3	0	008.7	SEARS	9	5018.3
4527.3	U	0227	RW	K	SØ	M	90	--	0800	PT	GR	3	04200	3	0	025.4	SEARS	9	5018.4
1540.4	T	0227	RW	K	SØ	M	90	--	0800	ØD	BR	3	04200	0	2	012.2	RØMANS	9	5019.1
2540.4	T	0227	RW	K	SØ	H	90	--	0800	ØD	GR	3	04200	3	0	017.5	RØMANS	9	5019.2
3540.4	T	0227	RW	K	SØ	L	90	--	0800	PT	BR	3	04200	3	0	010.3	RØMANS	9	5019.3
4540.4	T	0227	RW	K	SØ	M	90	--	0800	PT	GR	3	04200	3	0	012.5	RØMANS	9	5019.4
1528.3	U	0227	RW	K	SØ	M	90	--	0800	ØD	BR	3	04200	3	0	034.2	RØMANS	9	5020.1
2528.3	U	0227	RW	K	SØ	H	90	--	0800	ØD	GR	3	04200	3	0	015.9	RØMANS	9	5020.2
3528.3	U	0227	RW	K	SØ	L	90	--	0800	PT	BR	3	04200	3	0	002.0	RØMANS	1	5020.3
4528.3	U	0227	RW	K	SØ	M	90	--	0800	PT	GR	3	04200	3	0	012.4	RØMANS	9	5020.4
1541.4	T	0227	RW	K	EØ	M	90	--	0800	ØD	BR	3	04200	1	0	040.6	SEARS	7	5021.1
2541.4	T	0227	RW	K	EØ	H	90	--	0800	ØD	GR	3	04200	0	1	055.7	SEARS	7	5021.2
3541.4	T	0227	RW	K	EØ	L	90	--	0800	PT	BR	3	04200	3	0	004.9	SEARS	1	5021.3
4541.4	T	0227	RW	K	EØ	M	90	--	0800	PT	GR	3	04200	3	0	006.6	SEARS	1	5021.4
1529.4	U	0227	RW	K	EØ	M	90	--	0800	ØD	BR	3	04200	0	0	060.0	SEARS	7	5022.1
2529.4	U	0227	RW	K	EØ	H	90	--	0800	ØD	GR	3	04200	0	0	060.0	SEARS	7	5022.2
3529.4	U	0227	RW	K	EØ	L	90	--	0800	PT	BR	3	04200	3	0	010.4	SEARS	7	5022.3
4529.4	U	0227	RW	K	EØ	M	90	--	0800	PT	GR	3	04200	3	0	011.0	SEARS	7	5022.4
1542.4	T	0227	RW	K	EØ	M	90	--	0800	ØD	BR	3	04200	0	1	007.2	RØMANS	1	5023.1
2542.4	T	0227	RW	K	EØ	H	90	--	0800	ØD	GR	3	04200	2	0	025.5	RØMANS	7	5023.2
3542.4	T	0227	RW	K	EØ	L	90	--	0800	PT	BR	3	04200	3	0	002.4	RØMANS	1	5023.3
4542.4	T	0227	RW	K	EØ	M	90	--	0800	PT	GR	3	04200	3	0	006.0	RØMANS	1	5023.4
1530.3	U	0227	RW	K	EØ	M	90	--	0800	ØD	BR	3	04200	0	1	045.2	RØMANS	7	5024.1
2530.3	U	0227	RW	K	EØ	H	90	--	0800	ØD	GR	3	04200	0	0	060.0	RØMANS	G	5024.2
3530.3	U	0227	RW	K	EØ	L	90	--	0800	PT	BR	3	04200	3	0	004.2	RØMANS	1	5024.3
4530.3	U	0227	RW	K	EØ	M	90	--	0800	PT	GR	3	04200	3	0	023.6	RØMANS	7	5024.4
1549.4	T	0228	RW	L	DV	M	90	--	0800	PT	BR	3	01500	3	0	016.1	SEARS	1	5025.1
2549.4	T	0228	RW	L	DV	H	90	--	0800	PT	GR	3	01500	3	0	010.9	SEARS	1	5025.2
3549.4	T	0228	RW	L	DV	L	90	--	0800	ØD	BR	3	01500	3	0	001.4	SEARS	1	5025.3
4549.4	T	0228	RW	L	DV	M	90	--	0800	ØD	GR	3	01500	0	3	002.4	SEARS	1	5025.4
1543.4	U	0228	RW	L	DV	M	90	--	0800	PT	BR	3	01500	3	0	002.2	SEARS	1	5026.1
2543.4	U	0228	RW	L	DV	H	90	--	0800	PT	GR	3	01500	3	0	002.7	SEARS	1	5026.2
3543.4	U	0228	RW	L	DV	L	90	--	0800	ØD	BR	3	01500	3	0	001.7	SEARS	1	5026.3
4543.4	U	0228	RW	L	DV	M	90	--	0800	ØD	GR	3	01500	3	0	002.4	SEARS	1	5026.4

1550.3	T	0228	RW	L	DV	M	90	--	0800	PT	BR	3	01500	1	0	006.7	RØMANS	1	5027.1
2550.3	T	0228	RW	L	DV	H	90	--	0800	PT	GR	3	01500	3	0	001.5	RØMANS	1	5027.2
3550.3	T	0228	RW	L	DV	L	90	--	0800	ØD	BR	3	01500	3	0	000.9	RØMANS	1	5027.3
4550.3	T	0228	RW	L	DV	M	90	--	0800	ØD	GR	3	01500	3	0	003.3	RØMANS	1	5027.4
1544.3	U	0228	RW	L	DV	M	90	--	0800	PT	BR	3	01500	3	0	019.3	SEARS	1	5028.1
2544.3	U	0228	RW	L	DV	H	90	--	0800	PT	GR	3	01500	2	0	014.3	SEARS	1	5028.2
3544.3	U	0228	RW	L	DV	L	90	--	0800	ØD	BR	3	01500	3	0	001.4	SEARS	1	5028.3
4544.3	U	0228	RW	L	DV	M	90	--	0800	ØD	GR	3	01500	3	0	001.4	SEARS	1	5028.4
1551.4	T	0228	RW	L	SØ	M	90	--	0800	PT	BR	3	01500	3	0	004.9	SEARS	1	5029.1
2551.4	T	0228	RW	L	SØ	H	90	--	0800	PT	GR	3	01500	3	0	001.6	SEARS	1	5029.2
3551.4	T	0228	RW	L	SØ	L	90	--	0800	ØD	BR	3	01500	3	0	001.5	SEARS	1	5029.3
4551.4	T	0228	RW	L	SØ	M	90	--	0800	ØD	GR	3	01500	3	0	002.5	SEARS	1	5029.4
1545.4	U	0228	RW	L	SØ	M	90	--	0800	PT	BR	3	01500	3	0	006.0	SEARS	1	5030.1
2545.4	U	0228	RW	L	SØ	H	90	--	0800	PT	GR	3	01500	3	0	007.9	SEARS	1	5030.2
3545.4	U	0228	RW	L	SØ	L	90	--	0800	ØD	BR	3	01500	3	0	003.5	SEARS	1	5030.3
4545.4	U	0228	RW	L	SØ	M	90	--	0800	ØD	GR	3	01500	3	0	003.8	SEARS	1	5030.4
1552.0	T	0228	RW	L	SØ	M	90	--	0800	PT	BR	3	01500	3	0	007.5	RØMANS	9	5031.1
2552.0	T	0228	RW	L	SØ	H	90	--	0800	PT	GR	3	01500	3	0	001.9	RØMANS	1	5031.2
3552.0	T	0228	RW	L	SØ	L	90	--	0800	ØD	BR	3	01500	3	0	001.2	RØMANS	1	5031.3
4552.0	T	0228	RW	L	SØ	M	90	--	0800	ØD	GR	3	01500	3	0	001.7	RØMANS	1	5031.4
1546.3	U	0228	RW	L	SØ	M	90	--	0800	PT	BR	3	01500	3	0	006.4	RØMANS	1	5032.1
2546.3	U	0228	RW	L	SØ	H	90	--	0800	PT	GR	3	01500	3	0	003.4	RØMANS	1	5032.2
3546.3	U	0228	RW	L	SØ	L	90	--	0800	ØD	BR	3	01500	3	0	002.2	RØMANS	1	5032.3
4546.3	U	0228	RW	L	SØ	M	90	--	0800	ØD	GR	3	01500	3	0	001.8	RØMANS	1	5032.4
1553.4	T	0228	RW	L	EØ	M	90	--	0800	PT	BR	3	01500	3	0	005.0	SEARS	1	5033.1
2553.4	T	0228	RW	L	EØ	H	90	--	0800	PT	GR	3	01500	3	0	007.2	SEARS	1	5033.2
3553.4	T	0228	RW	L	EØ	L	90	--	0800	ØD	BR	3	01500	3	0	000.3	SEARS	1	5033.3
4553.4	T	0228	RW	L	EØ	M	90	--	0800	ØD	GR	3	01500	3	0	003.2	SEARS	1	5033.4
1547.3	U	0228	RW	L	EØ	M	90	--	0800	PT	BR	3	01500	0	2	022.8	SEARS	1	5034.1
2547.3	U	0228	RW	L	EØ	H	90	--	0800	PT	GR	3	01500	3	0	037.2	SEARS	7	5034.2
3547.3	U	0228	RW	L	EØ	L	90	--	0800	ØD	BR	3	01500	3	0	017.2	SEARS	1	5034.3
4547.3	U	0228	RW	L	EØ	M	90	--	0800	ØD	GR	3	01500	3	0	004.5	SEARS	1	5034.4
1554.4	T	0228	RW	L	EØ	M	90	--	0800	PT	BR	3	01500	0	0	060.0	RØMANS	G	5035.1
2554.4	T	0228	RW	L	EØ	H	90	--	0800	PT	GR	3	01500	3	0	002.1	RØMANS	1	5035.2
3554.4	T	0228	RW	L	EØ	L	90	--	0800	ØD	BR	3	01500	3	0	001.8	RØMANS	1	5035.3
4554.4	T	0228	RW	L	EØ	M	90	--	0800	ØD	GR	3	01500	3	0	001.7	RØMANS	1	5035.4
1548.4	U	0228	RW	L	EØ	M	90	--	0800	PT	BR	3	01500	3	0	043.2	RØMANS	1	5036.1
2548.4	U	0228	RW	L	EØ	H	90	--	0800	PT	GR	3	01500	3	0	009.9	RØMANS	1	5036.2
3548.4	U	0228	RW	L	EØ	L	90	--	0800	ØD	BR	3	01500	3	0	003.6	RØMANS	1	5036.3
4548.4	U	0228	RW	L	EØ	M	90	--	0800	ØD	GR	3	01500	3	0	010.3	RØMANS	1	5036.4
1561.4	T	0303	RW	L	DV	M	90	--	0800	PT	BR	3	04200	2	0	059.0	SEARS	1	5037.1
2561.4	T	0303	RW	L	DV	H	90	--	0800	PT	GR	3	04200	0	0	060.0	SEARS	1	5037.2
3561.4	T	0303	RW	L	DV	L	90	--	0800	ØD	BR	3	04200	3	0	007.1	SEARS	1	5037.3
4561.4	T	0303	RW	L	DV	M	90	--	0800	ØD	GR	3	04200	3	0	029.4	SEARS	1	5037.4
1555.4	U	0303	RW	L	DV	M	90	--	0800	PT	BR	3	04200	0	0	060.0	SEARS	1	5038.1
2555.4	U	0303	RW	L	DV	H	90	--	0800	PT	GR	3	04200	0	0	060.0	SEARS	1	5038.2
3555.4	U	0303	RW	L	DV	L	90	--	0800	ØD	BR	3	04200	3	0	006.0	SEARS	1	5038.3
4555.4	U	0303	RW	L	DV	M	90	--	0800	ØD	GR	3	04200	3	0	004.2	SEARS	1	5038.4
1562.4	T	0303	RW	L	DV	M	90	--	0800	PT	BR	3	04200	0	2	004.7	RØMANS	1	5039.1
2562.4	T	0303	RW	L	DV	H	90	--	0800	PT	GR	3	04200	0	0	060.0	RØMANS	A	5039.2
3562.4	T	0303	RW	L	DV	L	90	--	0800	ØD	BR	3	04200	3	0	002.5	RØMANS	1	5039.3
4562.4	T	0303	RW	L	DV	M	90	--	0800	ØD	GR	3	04200	3	0	007.7	RØMANS	1	5039.4
1556.4	U	0303	RW	L	DV	M	90	--	0800	PT	BR	3	04200	0	0	060.0	SEARS	1	5040.1

2556.4	U	0303	RW	L	DV	H	90	--	0800	PT	GR	3	04200	0	0	060.0	SEARS	1	5040.2
3556.4	U	0303	RW	L	DV	L	90	--	0800	ØD	BR	3	04200	3	0	002.0	SEARS	1	5040.3
4556.4	U	0303	RW	L	DV	M	90	--	0800	ØD	GR	3	04200	0	2	021.5	SEARS	1	5040.4
1563.3	T	0303	RW	L	SØ	M	90	--	0800	PT	BR	3	04200	1	0	020.5	SEARS	1	5041.1
2563.3	T	0303	RW	L	SØ	H	90	--	0800	PT	GR	3	04200	2	0	047.3	SEARS	1	5041.2
3563.3	T	0303	RW	L	SØ	L	90	--	0800	ØD	BR	3	04200	3	0	004.1	SEARS	1	5041.3
4563.3	T	0303	RW	L	SØ	M	90	--	0800	ØD	GR	3	04200	3	0	011.9	SEARS	1	5041.4
1557.3	U	0303	RW	L	SØ	M	90	--	0800	PT	BR	3	04200	0	2	021.4	SEARS	1	5042.1
2557.3	U	0303	RW	L	SØ	H	90	--	0800	PT	GR	3	04200	0	1	024.5	SEARS	1	5042.2
3557.3	U	0303	RW	L	SØ	L	90	--	0800	ØD	BR	3	04200	0	6	018.2	SEARS	1	5042.3
4557.3	U	0303	RW	L	SØ	M	90	--	0800	ØD	GR	3	04200	0	3	029.1	SEARS	1	5042.4
1564.3	T	0303	RW	L	SØ	M	90	--	0800	PT	BR	3	04200	3	0	015.0	RØMANS	9	5043.1
2564.3	T	0303	RW	L	SØ	H	90	--	0800	PT	GR	3	04200	3	0	021.1	RØMANS	9	5043.2
3564.3	T	0303	RW	L	SØ	L	90	--	0800	ØD	BR	3	04200	3	0	002.5	RØMANS	1	5043.3
4564.3	T	0303	RW	L	SØ	M	90	--	0800	ØD	GR	3	04200	3	0	009.5	RØMANS	9	5043.4
1558.3	U	0303	RW	L	SØ	M	90	--	0800	PT	BR	3	04200	2	0	021.8	RØMANS	9	5044.1
2558.3	U	0303	RW	L	SØ	H	90	--	0800	PT	GR	3	04200	1	0	025.5	RØMANS	9	5044.2
3558.3	U	0303	RW	L	SØ	[illegible]	90	--	0800	ØD	BR	3	04200	3	0	002.3	RØMANS	1	5044.3
4558.3	U	0303	RW	L	SØ	M	90	--	0800	ØD	GR	3	04200	3	3	014.8	RØMANS	9	5044.4
1565.4	T	0303	RW	L	EØ	M	90	--	0800	PT	BR	3	04200	0	0	060.0	SEARS	7	5045.1
2565.4	T	0303	RW	L	EØ	H	90	--	0800	PT	GR	3	04200	3	0	037.1	SEARS	7	5045.2
3565.4	T	0303	RW	L	EØ	L	90	--	0800	ØD	BR	3	04200	3	0	004.0	SEARS	1	5045.3
4565.4	T	0303	RW	L	EØ	M	90	--	0800	ØD	GR	3	04200	3	0	004.2	SEARS	1	5045.4
1559.4	U	0303	RW	L	EØ	M	90	--	0800	PT	BR	3	04200	0	0	060.0	SEARS	7	5046.1
2559.4	U	0303	RW	L	EØ	H	90	--	0800	PT	GR	3	04200	0	0	060.0	SEARS	7	5046.2
3559.4	U	0303	RW	L	EØ	L	90	--	0800	ØD	BR	3	04200	3	0	002.9	SEARS	1	5046.3
4559.4	U	0303	RW	L	EØ	M	90	--	0800	ØD	GR	3	04200	0	0	060.0	SEARS	G	5046.4
1566.4	T	0303	RW	L	EØ	M	90	--	0800	PT	BR	3	04200	1	0	029.5	RØMANS	7	5047.1
2566.4	T	0303	RW	L	EØ	H	90	--	0800	PT	GR	3	04200	1	0	029.6	RØMANS	7	5047.2
3566.4	T	0303	RW	L	EØ	L	90	--	0800	ØD	BR	3	04200	3	0	006.2	RØMANS	1	5047.3
4566.4	T	0303	RW	L	EØ	M	90	--	0800	ØD	GR	3	04200	3	0	010.4	RØMANS	1	5047.4
1560.0	U	0303	RW	L	EØ	M	90	--	0800	PT	BR	3	04200	1	0	028.9	RØMANS	7	5048.1
2560.0	U	0303	RW	L	EØ	H	90	--	0800	PT	GR	3	04200	0	0	060.0	RØMANS	G	5048.2
3560.0	U	0303	RW	L	EØ	L	90	--	0800	ØD	BR	3	04200	3	0	002.0	RØMANS	1	5048.3
4560.0	U	0303	RW	L	EØ	M	90	--	0800	ØD	GR	3	04200	3	0	018.6	RØMANS	7	5048.4
1577.4	T	0304	RW	M	DV	M	90	--	0800	PT	GR	3	01500	3	0	006.3	SEARS	1	5049.1
2577.4	T	0304	RW	M	DV	H	90	--	0800	PT	BR	3	01500	3	0	002.0	SEARS	1	5049.2
3577.4	T	0304	RW	M	DV	L	90	--	0800	ØD	GR	3	01500	3	0	001.1	SEARS	1	5049.3
4577.4	T	0304	RW	M	DV	M	90	--	0800	ØD	BR	3	01500	3	0	002.1	SEARS	1	5049.4
1567.3	U	0304	RW	M	DV	M	90	--	0800	PT	GR	3	01500	3	0	003.9	MØYA	1	5050.1
2567.3	U	0304	RW	M	DV	H	90	--	0800	PT	BR	3	01500	2	0	023.0	MØYA	A	5050.2
3567.3	U	0304	RW	M	DV	L	90	--	0800	ØD	GR	3	01500	3	0	001.3	MØYA	1	5050.3
4567.3	U	0304	RW	M	DV	M	90	--	0800	ØD	BR	3	01500	3	0	001.6	MØYA	1	5050.4
1578.4	T	0304	RW	M	DV	M	90	--	0800	PT	GR	3	01500	3	0	010.2	RØMANS	1	5051.1
2578.4	T	0304	RW	M	DV	H	90	--	0800	PT	BR	3	01500	3	0	003.5	RØMANS	1	5051.2
3578.4	T	0304	RW	M	DV	L	90	--	0800	ØD	GR	3	01500	3	0	001.0	RØMANS	1	5051.3
4578.4	T	0304	RW	M	DV	M	90	--	0800	ØD	BR	3	01500	3	0	002.4	RØMANS	1	5051.4
1568.3	U	0304	RW	M	DV	M	90	--	0800	PT	GR	3	01500	0	0	060.0	RØMANS	A	5052.1
2568.3	U	0304	RW	M	DV	H	90	--	0800	PT	BR	3	01500	2	0	017.8	RØMANS	1	5052.2
3568.3	U	0304	RW	M	DV	L	90	--	0800	ØD	GR	3	01500	3	0	002.9	RØMANS	1	5052.3
4568.3	U	0304	RW	M	DV	M	90	--	0800	ØD	BR	3	01500	3	0	003.2	RØMANS	1	5052.4
1579.4	T	0304	RW	M	SØ	M	90	--	0800	PT	GR	3	01500	3	0	052.6	SEARS	9	5053.1
2579.4	T	0304	RW	M	SØ	H	90	--	0800	PT	BR	3	01500	3	0	005.5	SEARS	1	5053.2

3579.4	T	0304	RW	M	SØ	L	90	--	0800	ØD	GR	3	01500	3	0	001.5	SEARS	1	5053.3
4579.4	T	0304	RW	M	SØ	M	90	--	0800	ØD	BR	3	01500	3	0	001.9	SEARS	1	5053.4
1569.4	U	0304	RW	M	SØ	M	90	--	0800	PT	GR	3	01500	3	0	010.5	SEARS	1	5054.1
2569.4	U	0304	RW	M	SØ	H	90	--	0800	PT	BR	3	01500	3	0	013.8	SEARS	1	5054.2
3569.4	U	0304	RW	M	SØ	L	90	--	0800	ØD	GR	3	01500	3	0	001.8	SEARS	1	5054.3
4569.4	U	0304	RW	M	SØ	M	90	--	0800	ØD	BR	3	01500	3	0	004.6	SEARS	1	5054.4
1580.4	T	0304	RW	M	SØ	M	90	--	0800	PT	GR	3	01500	3	0	006.8	RØMANS	1	5055.1
2580.4	T	0304	RW	M	SØ	H	90	--	0800	PT	BR	3	01500	3	0	006.9	RØMANS	9	5055.2
3580.4	T	0304	RW	M	SØ	L	90	--	0800	ØD	GR	3	01500	3	0	002.3	RØMANS	1	5055.3
4580.4	T	0304	RW	M	SØ	M	90	--	0800	ØD	BR	3	01500	3	0	001.1	RØMANS	1	5055.4
1570.3	U	0304	RW	M	SØ	M	90	--	0800	PT	GR	3	01500	0	1	011.0	RØMANS	1	5056.1
2570.3	U	0304	RW	M	SØ	H	90	--	0800	PT	BR	3	01500	1	0	002.4	RØMANS	1	5056.2
3570.3	U	0304	RW	M	SØ	L	90	--	0800	ØD	GR	3	01500	3	0	007.1	RØMANS	1	5056.3
4570.3	U	0304	RW	M	SØ	M	90	--	0800	ØD	BR	3	01500	3	0	005.8	RØMANS	1	5056.4
1581.4	T	0304	RW	M	EØ	M	90	--	0800	PT	GR	3	01500	3	0	003.2	SEARS	1	5057.1
2581.4	T	0304	RW	M	EØ	H	90	--	0800	PT	BR	3	01500	3	0	005.3	SEARS	1	5057.2
3581.4	T	0304	RW	M	EØ	L	90	--	0800	ØD	GR	3	01500	3	0	001.0	SEARS	1	5057.3
4581.4	T	0304	RW	M	EØ	M	90	--	0800	ØD	BR	3	01500	1	0	003.5	SEARS	1	5057.4
1571.3	U	0304	RW	M	EØ	M	90	--	0800	PT	GR	3	01500	3	0	007.7	SEARS	1	5058.1
2571.3	U	0304	RW	M	EØ	H	90	--	0800	PT	BR	3	01500	3	0	033.8	SEARS	7	5058.2
3571.3	U	0304	RW	M	EØ	L	90	--	0800	ØD	GR	3	01500	3	0	005.8	SEARS	1	5058.3
4571.3	U	0304	RW	M	EØ	M	90	--	0800	ØD	BR	3	01500	3	0	007.8	SEARS	1	5058.4
1582.4	T	0304	RW	M	EØ	M	90	--	0800	PT	GR	3	01500	3	0	002.2	RØMANS	1	5059.1
2582.4	T	0304	RW	M	EØ	H	90	--	0800	PT	BR	3	01500	3	0	003.0	RØMANS	1	5059.2
3582.4	T	0304	RW	M	EØ	L	90	--	0800	ØD	GR	3	01500	3	0	001.0	RØMANS	1	5059.3
4582.4	T	0304	RW	M	EØ	M	90	--	0800	ØD	BR	3	01500	3	0	001.1	RØMANS	1	5059.4
1572.3	U	0304	RW	M	EØ	M	90	--	0800	PT	GR	3	01500	3	0	003.4	RØMANS	1	5060.1
2572.3	U	0304	RW	M	EØ	H	90	--	0800	PT	BR	3	01500	3	0	003.1	RØMANS	1	5060.2
3572.3	U	0304	RW	M	EØ	L	90	--	0800	ØD	GR	3	01500	3	0	002.1	RØMANS	1	5060.3
4572.3	U	0304	RW	M	EØ	M	90	--	0800	ØD	BR	3	01500	3	0	002.8	RØMANS	1	5060.4
1583.4	T	0304	RW	M	DV	M	90	--	0800	PT	GR	3	04200	3	0	010.9	SEARS	1	5061.1
2583.4	T	0304	RW	M	DV	H	90	--	0800	PT	BR	3	04200	1	0	051.2	SEARS	1	5061.2
3583.4	T	0304	RW	M	DV	L	90	--	0800	ØD	GR	3	04200	3	0	001.5	SEARS	1	5061.3
4583.4	T	0304	RW	M	DV	M	90	--	0800	ØD	BR	3	04200	3	0	017.7	SEARS	1	5061.4
1573.3	U	0304	RW	M	DV	M	90	--	0800	PT	GR	3	04200	3	0	035.3	SEARS	1	5062.1
2573.3	U	0304	RW	M	DV	H	90	--	0800	PT	BR	3	04200	0	0	060.0	SEARS	1	5062.2
3573.3	U	0304	RW	M	DV	L	90	--	0800	ØD	GR	3	04200	3	0	001.9	SEARS	1	5062.3
4573.3	U	0304	RW	M	DV	M	90	--	0800	ØD	BR	3	04200	0	0	060.0	SEARS	1	5062.4
1584.4	T	0304	RW	M	DV	M	90	--	0800	PT	GR	3	04200	2	0	004.9	RØMANS	1	5063.1
2584.4	T	0304	RW	M	DV	H	90	--	0800	PT	BR	3	04200	0	0	060.0	RØMANS	A	5063.2
3584.4	T	0304	RW	M	DV	L	90	--	0800	ØD	GR	3	04200	3	0	001.3	RØMANS	1	5063.3
4584.4	T	0304	RW	M	DV	M	90	--	0800	ØD	BR	3	04200	3	0	004.1	RØMANS	1	5063.4
1574.3	U	0304	RW	M	DV	M	90	--	0800	PT	GR	3	04200	0	1	060.0	RØMANS	1	5064.1
2574.3	U	0304	RW	M	DV	H	90	--	0800	PT	BR	3	04200	0	1	033.5	RØMANS	1	5064.2
3574.3	U	0304	RW	M	DV	L	90	--	0800	ØD	GR	3	04200	3	0	007.7	RØMANS	1	5064.3
4574.3	U	0304	RW	M	DV	M	90	--	0800	ØD	BR	3	04200	3	0	015.1	RØMANS	1	5064.4
1585.4	T	0304	RW	M	SØ	M	90	--	0800	PT	GR	3	04200	3	0	007.5	SEARS	9	5065.1
2585.4	T	0304	RW	M	SØ	H	90	--	0800	PT	BR	3	04200	3	0	008.7	SEARS	9	5065.2
3585.4	T	0304	RW	M	SØ	L	90	--	0800	ØD	GR	3	04200	3	0	002.4	SEARS	1	5065.3
4585.4	T	0304	RW	M	SØ	M	90	--	0800	ØD	BR	3	04200	3	0	010.5	SEARS	9	5065.4
1575.4	U	0304	RW	M	SØ	M	90	--	0800	PT	GR	3	04200	3	0	010.2	SEARS	9	5066.1
2575.4	U	0304	RW	M	SØ	H	90	--	0800	PT	BR	3	04200	3	0	003.7	SEARS	9	5066.2
3575.4	U	0304	RW	M	SØ	L	90	--	0800	ØD	GR	3	04200	3	0	002.9	SEARS	9	5066.3

4575.4	U	0304	RW	M	SØ	M	90	--	0800	ØD	BR	3	04200	0	6	005.7	SEARS	8	5066.4
1586.4	T	0305	RW	M	SØ	M	90	--	0800	PT	GR	3	04200	3	0	021.6	SEARS	9	5067.1
2586.4	T	0305	RW	M	SØ	H	90	--	0800	PT	BR	3	04200	3	0	022.7	SEARS	9	5067.2
3586.4	T	0305	RW	M	SØ	L	90	--	0800	ØD	GR	3	04200	3	0	021.8	SEARS	9	5067.3
4586.4	T	0305	RW	M	SØ	M	90	--	0800	ØD	BR	3	04200	3	0	034.9	SEARS	9	5067.4
1576.3	U	0304	RW	M	SØ	M	90	--	0800	PT	GR	3	04200	2	1	020.7	RØMANS	9	5068.1
2576.3	U	0304	RW	M	SØ	H	90	--	0800	PT	BR	3	04200	0	0	060.0	RØMANS	J	5068.2
3576.3	U	0304	RW	M	SØ	L	90	--	0800	ØD	GR	3	04200	3	0	014.7	RØMANS	9	5068.3
4576.3	U	0304	RW	M	SØ	M	90	--	0800	ØD	BR	3	04200	3	0	012.2	RØMANS	9	5068.4
1587.4	T	0305	RW	M	EØ	M	90	--	0800	PT	GR	3	04200	0	0	060.0	RØMANS	G	5069.1
2587.4	T	0305	RW	M	EØ	H	90	--	0800	PT	BR	3	04200	0	1	031.2	RØMANS	7	5069.2
3587.4	T	0305	RW	M	EØ	L	90	--	0800	ØD	GR	3	04200	3	0	005.0	RØMANS	1	5069.3
4587.4	T	0305	RW	M	EØ	M	90	--	0800	ØD	BR	3	04200	3	0	009.8	RØMANS	7	5069.4
1588.3	U	0305	RW	M	EØ	M	90	--	0800	PT	GR	3	04200	0	0	060.0	SEARS	4	5070.1
2588.3	U	0305	RW	M	EØ	H	90	--	0800	PT	BR	3	04200	0	0	060.0	SEARS	7	5070.2
3588.3	U	0305	RW	M	EØ	L	90	--	0800	ØD	GR	3	04200	3	0	022.1	SEARS	7	5070.3
4588.3	U	0305	RW	M	EØ	M	90	--	0800	ØD	BR	3	04200	3	0	060.0	SEARS	7	5070.4
1590.4	T	0305	RW	M	EØ	M	90	--	0800	PT	GR	3	04200	2	0	052.7	RØMANS	7	5071.1
2590.4	T	0305	RW	M	EØ	H	90	--	0800	PT	BR	3	04200	3	0	028.8	RØMANS	7	5071.2
3590.4	T	0305	RW	M	EØ	L	90	--	0800	ØD	GR	3	04200	3	0	002.8	RØMANS	1	5071.3
4590.4	T	0305	RW	M	EØ	M	90	--	0800	ØD	BR	3	04200	3	0	012.2	RØMANS	1	5071.4
1589.4	U	0305	RW	M	EØ	M	90	--	0800	PT	GR	3	04200	3	0	008.8	RØMANS	1	5072.1
2589.4	U	0305	RW	M	EØ	H	90	--	0800	PT	BR	3	04200	3	0	055.3	RØMANS	7	5072.2
3589.4	U	0305	RW	M	EØ	L	90	--	0800	ØD	GR	3	04200	3	0	006.3	RØMANS	1	5072.3
4589.4	U	0305	RW	M	EØ	M	90	--	0800	ØD	BR	3	04200	3	0	049.1	RØMANS	7	5072.4
1591.3	T	0305	RW	N	DV	M	90	--	0800	ØD	GR	3	01500	3	0	003.3	RØMANS	1	5073.1
2591.3	T	0305	RW	N	DV	H	90	--	0800	ØD	BR	3	01500	3	0	003.2	RØMANS	1	5073.2
3591.3	T	0305	RW	N	DV	L	90	--	0800	PT	GR	3	01500	3	0	002.0	RØMANS	1	5073.3
4591.3	T	0305	RW	N	DV	M	90	--	0800	PT	BR	3	01500	3	0	002.3	RØMANS	1	5073.4
1598.3	U	0305	RW	N	DV	M	90	--	0800	ØD	GR	3	01500	3	0	002.6	SEARS	1	5074.1
2598.3	U	0305	RW	N	DV	H	90	--	0800	ØD	BR	3	01500	3	0	002.8	SEARS	1	5074.2
3598.3	U	0305	RW	N	DV	L	90	--	0800	PT	GR	3	01500	3	0	001.3	SEARS	1	5074.3
4598.3	U	0305	RW	N	DV	M	90	--	0800	PT	BR	3	01500	3	0	002.3	SEARS	1	5074.4
1592.4	T	0305	RW	N	DV	M	90	--	0800	ØD	GR	3	01500	3	0	002.8	SEARS	1	5075.1
2592.4	T	0305	RW	N	DV	H	90	--	0800	ØD	BR	3	01500	3	0	002.2	SEARS	1	5075.2
3592.4	T	0305	RW	N	DV	L	90	--	0800	PT	GR	3	01500	3	0	001.2	SEARS	1	5075.3
4592.4	T	0305	RW	N	DV	M	90	--	0800	PT	BR	3	01500	3	0	001.6	SEARS	1	5075.4
1599.3	U	0305	RW	N	DV	M	90	--	0800	ØD	GR	3	01500	3	0	004.4	RØMANS	1	5076.1
2599.3	U	0305	RW	N	DV	H	90	--	0800	ØD	BR	3	01500	3	0	004.6	RØMANS	1	5076.2
3599.3	U	0305	RW	N	DV	L	90	--	0800	PT	GR	3	01500	3	0	005.3	RØMANS	1	5076.3
4599.3	U	0305	RW	N	DV	M	90	--	0800	PT	BR	3	01500	3	0	005.7	RØMANS	1	5076.4
1593.4	T	0305	RW	N	SØ	M	90	--	0800	ØD	GR	3	01500	3	0	001.9	RØMANS	1	5077.1
2593.4	T	0305	RW	N	SØ	H	90	--	0800	ØD	BR	3	01500	2	0	003.6	RØMANS	1	5077.2
3593.4	T	0305	RW	N	SØ	L	90	--	0800	PT	GR	3	01500	3	0	001.1	RØMANS	1	5077.3
4593.4	T	0305	RW	N	SØ	M	90	--	0800	PT	BR	3	01500	3	0	002.5	RØMANS	1	5077.4
1601.4	U	0306	RW	N	SØ	M	90	--	0800	ØD	GR	3	01500	3	0	016.9	SEARS	1	5078.1
2601.4	U	0306	RW	N	SØ	H	90	--	0800	ØD	BR	3	01500	3	0	007.0	SEARS	1	5078.2
3601.4	U	0306	RW	N	SØ	L	90	--	0800	PT	GR	3	01500	3	0	002.0	SEARS	1	5078.3
4601.4	U	0306	RW	N	SØ	M	90	--	0800	PT	BR	3	01500	3	0	006.4	SEARS	1	5078.4
1594.4	T	0305	RW	N	SØ	M	90	--	0800	ØD	GR	3	01500	3	0	004.3	SEARS	1	5079.1
2594.4	T	0305	RW	N	SØ	H	90	--	0800	ØD	BR	3	01500	3	0	002.2	SEARS	1	5079.2
3594.4	T	0305	RW	N	SØ	L	90	--	0800	PT	GR	3	01500	3	0	001.3	SEARS	1	5079.3
4594.4	T	0305	RW	N	SØ	M	90	--	0800	PT	BR	3	01500	3	0	002.0	SEARS	1	5079.4

1602.4	U	0306	RW	N	SB	M	90	--	0800	HD	GR	3	01500	3	0	001.5	ROMANS	1	5080.1
2602.4	U	0306	RW	N	SB	H	90	--	0800	HD	BR	3	01500	3	0	002.3	ROMANS	1	5080.2
3602.4	U	0306	RW	N	SB	L	90	--	0800	PT	GR	3	01500	3	0	001.4	ROMANS	1	5080.3
4602.4	U	0306	RW	N	SB	M	90	--	0800	PT	BR	3	01500	3	0	001.3	ROMANS	1	5080.4
1595.4	T	0305	RW	N	EB	M	90	--	0800	HD	GR	3	01500	3	0	002.9	ROMANS	1	5081.1
2595.4	T	0305	RW	N	EB	H	90	--	0800	HD	BR	3	01500	3	0	003.4	ROMANS	1	5081.2
3595.4	T	0305	RW	N	EB	L	90	--	0800	PT	GR	3	01500	3	0	001.7	ROMANS	1	5081.3
4595.4	T	0305	RW	N	EB	M	90	--	0800	PT	BR	3	01500	3	0	005.1	ROMANS	1	5081.4
1603.4	U	0306	RW	N	EB	M	90	--	0800	HD	GR	3	01500	3	0	003.[illegible]	SEARS	1	5082.1
2603.4	U	0306	RW	N	EB	H	90	--	0800	HD	BR	3	01500	3	0	002.7	SEARS	1	5082.2
3603.4	U	0306	RW	N	EB	L	90	--	0800	PT	GR	3	01500	3	0	001.1	SEARS	1	5082.3
4603.4	U	0306	RW	N	EB	M	90	--	0800	PT	BR	3	01500	3	0	001.[illegible]	SEARS	1	5082.4
1596.3	T	0305	RW	N	EB	M	90	--	0800	HD	GR	3	01500	3	0	003.1	SEARS	1	5083.1
2596.3	T	0305	RW	N	EB	H	90	--	0800	HD	BR	3	01500	2	0	007.[illegible]	SEARS	1	5083.2
3596.3	T	0305	RW	N	EB	L	90	--	0800	PT	GR	3	01500	3	0	006.7	SEARS	1	5083.3
4596.3	T	0305	RW	N	EB	M	90	--	0800	PT	BR	3	01500	3	0	004.7	SEARS	1	5083.4
1604.3	U	0306	RW	N	EB	M	90	--	0800	HD	GR	3	01500	3	[illegible]	019.3	ROMANS	1	5084.1
2604.3	U	0306	RW	N	EB	H	90	--	0800	HD	BR	3	01500	3	0	003.7	ROMANS	1	5084.2
3604.3	U	0306	RW	N	EB	L	90	--	0800	PT	GR	3	01500	3	0	001.3	ROMANS	1	5084.3
4604.3	U	0306	RW	N	EB	M	90	--	0800	PT	BR	3	01500	3	0	[illegible].3	ROMANS	1	5084.4
1597.4	T	0305	RW	N	DV	M	90	--	0800	HD	GR	3	04200	3		[illegible].4	ROMANS	1	5085.1
2597.4	T	0305	RW	N	DV	H	90	--	0800	HD	BR	3	04200	1	[illegible]	014.[illegible]	ROMANS	1	5085.2
3597.4	T	0305	RW	N	DV	L	90	--	0800	PT	GR	3	04200	3	0	002.6	ROMANS	1	5085.3
4597.4	T	0305	RW	N	DV	M	90	--	0800	PT	BR	3	04200	3	0	005.3	ROMANS	1	5085.4
1605.4	U	0306	RW	N	DV	M	90	--	0800	HD	GR	3	04200	0	2	011.2	SEARS	1	5086.1
2605.4	U	0306	RW	N	DV	H	90	--	0800	HD	BR	3	04200	0	1	026.9	SEARS	1	5086.2
3605.4	U	0306	RW	N	DV	L	90	--	0800	PT	GR	3	04200	3	0	001.6	SEARS	1	5086.3
4605.4	U	0306	RW	N	DV	M	90	--	0800	PT	BR	3	04200	0	3	013.4	SEARS	1	5086.4
1611.4	T	0306	RW	N	DV	M	90	--	0800	HD	GR	3	04200	3	0	005.1	SEARS	1	5087.1
2611.4	T	0306	RW	N	DV	H	90	--	0800	HD	BR	3	04200	1	0	032.[illegible]	SEARS	1	5087.2
3611.4	T	0306	RW	N	DV	L	90	--	0800	PT	GR	3	04200	3	0	001.6	SEARS	1	5087.3
4611.4	T	0306	RW	N	DV	M	90	--	0800	PT	BR	3	04200	3	0	006.3	SEARS	1	5087.4
1606.3	U	0306	RW	N	DV	M	90	--	0800	HD	GR	3	04200	2	0	002.4	ROMANS	1	5088.1
2606.3	U	0306	RW	N	DV	H	90	--	0800	HD	BR	3	04200	0	1	021.2	ROMANS	1	5088.2
3606.3	U	0306	RW	N	DV	L	90	--	0800	PT	GR	3	04200	3	0	001.6	ROMANS	1	5088.3
4606.3	U	0306	RW	N	DV	M	90	--	0800	PT	BR	3	04200	0	0	011.4	ROMANS	1	5088.4
1612.4	T	0306	RW	N	SB	M	90	--	0800	HD	GR	3	04200	3	0	034.7	ROMANS	9	5089.1
2612.4	T	0306	RW	N	SB	H	90	--	0800	HD	BR	3	04200	2	0	019.5	ROMANS	9	5089.2
3612.4	T	0306	RW	N	SB	L	90	--	0800	PT	GR	3	04200	3	0	002.4	ROMANS	1	5089.3
4612.4	T	0306	RW	N	SB	M	90	--	0800	PT	BR	3	04200	3	0	008.6	ROMANS	9	5089.4
1607.4	U	0306	RW	N	SB	M	90	--	0800	HD	GR	3	04200	3	0	016.0	SEARS	9	5090.1
2607.4	U	0306	RW	N	SB	H	90	--	0800	HD	BR	3	04200	3	0	023.1	SEARS	9	5090.2
3607.4	U	0306	RW	N	SB	L	90	--	0800	PT	GR	3	04200	3	0	013.1	SEARS	9	5090.3
4607.4	U	0306	RW	N	SB	M	90	--	0800	PT	BR	3	04200	3	0	012.3	SEARS	9	5090.4
1613.0	T	0306	RW	N	SB	M	90	--	0800	HD	GR	3	04200	3	0	024.0	SEARS	9	5091.1
2613.0	T	0306	RW	N	SB	H	90	--	0800	HD	BR	3	04200	0	1	022.3	SEARS	9	5091.2
3613.0	T	0306	RW	N	SB	L	90	--	0800	PT	GR	3	04200	3	0	002.3	SEARS	9	5091.3
4613.0	T	0306	RW	N	SB	M	90	--	0800	PT	BR	3	04200	0	1	029.8	SEARS	9	5091.4
1608.4	U	0306	RW	N	SB	M	90	--	0800	HD	GR	3	04200	3	0	021.8	ROMANS	9	5092.1
2608.4	U	0306	RW	N	SB	H	90	--	0800	HD	BR	3	04200	3	0	011.2	ROMANS	9	5092.2
3608.4	U	0306	RW	N	SB	L	90	--	0800	PT	GR	3	04200	3	0	002.4	ROMANS	[illegible]	5092.3
4608.4	U	0306	RW	N	SB	M	90	--	0800	PT	BR	3	04200	3	0	008.3	ROMANS	9	5092.4
1614.4	T	0306	RW	N	EB	M	90	--	0800	HD	GR	3	04200	0	0	060.0	ROMANS	[illegible]	5093.1

2614•4	T	0306	RW	N	EΘ	H	90	--	0800	ΘD	BR	3	04200	0	0	060•0	RΘMANS	N	5093•2
3614•4	T	0306	RW	N	EΘ	L	90	--	0800	PT	GR	3	04200	3	0	001•6	RΘMANS	1	5093•3
4614•4	T	0306	RW	N	EΘ	M	90	--	0800	PT	BR	3	04200	3	0	024•9	RΘMANS	9	5093•4
1609•4	U	0306	RW	N	EΘ	M	90	--	0800	ΘD	GR	3	04200	0	2	060•0	SEARS	7	5094•1
2609•4	U	0306	RW	N	EΘ	H	90	--	0800	ΘD	BR	3	04200	0	3	052•9	SEARS	7	5094•2
3609•4	U	0306	RW	N	EΘ	L	90	--	0800	PT	GR	3	04200	3	0	003•6	SEARS	1	5094•3
4609•4	U	0306	RW	N	EΘ	M	90	--	0800	PT	BR	3	04200	3	0	020•6	SEARS	7	5094•4
1615•4	T	0306	RW	N	EΘ	M	90	--	0800	ΘD	GR	3	04200	0	0	060•0	RΘMANS	J	5095•1
2615•4	T	0306	RW	N	EΘ	H	90	--	0800	ΘD	BR	3	04200	2	0	031•0	RΘMANS	9	5095•2
3615•4	T	0306	RW	N	EΘ	L	90	--	0800	PT	GR	3	04200	3	0	003•6	RΘMANS	1	5095•3
4615•4	T	0306	RW	N	EΘ	M	90	--	0800	PT	BR	3	04200	3	0	035•2	RΘMANS	9	5095•4
1610•3	U	0306	RW	N	EΘ	M	90	--	0800	ΘD	GR	3	04200	1	0	016•3	RΘMANS	7	5096•1
2610•3	U	0306	RW	N	EΘ	H	90	--	0800	ΘD	BR	3	04200	1	0	026•4	RΘMANS	7	5096•2
3610•3	U	0306	RW	N	EΘ	L	90	--	0800	PT	GR	3	04200	3	0	004•4	RΘMANS	1	5096•3
4610•3	U	0306	RW	N	EΘ	M	90	--	0800	PT	BR	3	04200	3	0	021•9	RΘMANS	7	5096•4

END

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